



# Service Manual

## P7200



Model : P7200



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# 1. INTRODUCTION

## 1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

## 1.2 Regulatory Information

### A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that result from such unauthorized use.

### B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

### C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the this phone or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

### D. Maintenance Limitations

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs except as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

# 1. INTRODUCTION

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## E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

## F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

## G. Interference and Attenuation

Phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

## H. Electrostatic Sensitive Devices

### ATTENTION

**Boards, which contain Electrostatic Sensitive Device (ESD), are indicated  by the sign. Following information is ESD handling:**

- Service personnel should ground themselves by using a wrist strap when exchange system boards.
- When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
- Use a suitable, grounded soldering iron.
- Keep sensitive parts in these protective packages until these are used.
- When returning system boards or parts like EEPROM to the factory, use the protective package as described.

### 1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

APC	Automatic Power Control
BB	Baseband
BER	Bit Error Ratio
CC-CV	Constant Current - Constant Voltage
DAC	Digital to Analog Converter
DCS	Digital Communication System
dBm	dB relative to 1 milli watt
DSP	Digital Signal Processing
EEPROM	Electrical Erasable Programmable Read-Only Memory
ESD	Electrostatic Discharge
FPCB	Flexible Printed Circuit Board
GMSK	Gaussian Minimum Shift Keying
GPIO	General Purpose Interface Bus
GSM	Global System for Mobile Communications
IPUI	International Portable User Identity
IF	Intermediate Frequency
LCD	Liquid Crystal Display
LDO	Low Drop Output
LED	Light Emitting Diode
OPLL	Offset Phase Locked Loop

## 1. INTRODUCTION

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PAM	Power Amplifier Module
PCB	Printed Circuit Board
PGA	Programmable Gain Amplifier
PLL	Phase Locked Loop
PSTN	Public Switched Telephone Network
RF	Radio Frequency
RLR	Receiving Loudness Rating
RMS	Root Mean Square
RTC	Real Time Clock
SAW	Surface Acoustic Wave
SIM	Subscriber Identity Module
SLR	Sending Loudness Rating
SRAM	Static Random Access Memory
PSRAM	Pseudo SRAM
STMR	Side Tone Masking Rating
TA	Travel Adapter
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
UART	Universal Asynchronous Receiver/Transmitter
VCO	Voltage Controlled Oscillator
VCTCXO	Voltage Control Temperature Compensated Crystal Oscillator
WAP	Wireless Application Protocol

## 2. PERFORMANCE

### 2.1 H/W Features

Item	Feature	Comment
Standard Battery	Li-Poly, 800mAh Battery Size : 105.5 (W) × 44(H) × 15.8(T) [mm] Battery Weight : TBD	
Stand by Current	Under the minimum current consumption environment (such as paging period 9), the level of standby current is below 4mA.	
Talk time	Up to 2 hours (GSM TX Level 5)	
Stand by time	Up to 200 hours (Paging Period: 9, RSSI: -85 dBm)	
Charging time	Approx. Under 3.75 hours	
RX Sensitivity	GSM, EGSM: -104dBm, DCS: -104dBm	
TX output power	GSM, EGSM : 33dBm(Level 5), DCS, PCS : 30dBm(Level 0)	
GPRS compatibility	Class 10	
SIM card type	3V Small Only	
Display	Main LCD : TFT 176 × 220 pixel 260K Color Sub LCD : TFT 96 × 96 pixel 65K Color	
Status Indicator	Hard icons. Key Pad 0 ~ 9, #, *, Menu Key, Clear Key, Confirm Key, Side Key, Shot Key Send Key, END/PWR Key, Left, Right, Up, Down Key Soft Key(Left/Right), Hot Key(Left/Right)	
ANT	Internal	
EAR Phone Jack	Yes (stereo)	
PC Synchronization	Yes	
Speech coding	EFR/FR/HR	
Data and Fax	Yes	
Vibrator	Yes	
Loud Speaker	Yes	
Voice Recoding	Yes	
Microphone	Yes	
Speaker/Receiver	Dual speaker/Receiver	
Travel Adapter	Yes	
MIDI	64 Poly (Stereo SPK)	
MP3/AAC	Yes	
Options	Data Cable	



## 2. PERFORMANCE

### 2.2 Technical Specification

Item	Description	Specification																																																						
1	Frequency Band	<b>EGSM</b> • TX: 890 + (n-1024) x 0.2 MHz • RX: 935 + (n-1024) x 0.2 MHz (n=975~1024) <b>DCS</b> • TX: 1710 + (n-512) x 0.2 MHz • RX: 1805 + (n-512) x 0.2 MHz (n=512~885) <b>PCS</b> • TX: 1810 + (n-512) x 0.2 MHz • RX: 1905 + (n-512) x 0.2 MHz (n=512~885)																																																						
2	Phase Error	RMS < 5 degrees Peak < 20 degrees																																																						
3	Frequency Error	< 0.1 ppm																																																						
4	Power Level	<b>GSM, EGSM</b>																																																						
		<table><tr><th>Level</th><th>Power</th><th>Toler.</th><th>Level</th><th>Power</th><th>Toler.</th></tr><tr><td>5</td><td>33 dBm</td><td>±2dB</td><td>13</td><td>17 dBm</td><td>±3dB</td></tr><tr><td>6</td><td>31 dBm</td><td>±3dB</td><td>14</td><td>15 dBm</td><td>±3dB</td></tr><tr><td>7</td><td>29 dBm</td><td>±3dB</td><td>15</td><td>13 dBm</td><td>±3dB</td></tr><tr><td>8</td><td>27 dBm</td><td>±3dB</td><td>16</td><td>11 dBm</td><td>±5dB</td></tr><tr><td>9</td><td>25 dBm</td><td>±3dB</td><td>17</td><td>9 dBm</td><td>±5dB</td></tr><tr><td>10</td><td>23 dBm</td><td>±3dB</td><td>18</td><td>7 dBm</td><td>±5dB</td></tr><tr><td>11</td><td>21 dBm</td><td>±3dB</td><td>19</td><td>5 dBm</td><td>±5dB</td></tr><tr><td>12</td><td>19 dBm</td><td>±3dB</td><td></td><td></td><td></td></tr></table>	Level	Power	Toler.	Level	Power	Toler.	5	33 dBm	±2dB	13	17 dBm	±3dB	6	31 dBm	±3dB	14	15 dBm	±3dB	7	29 dBm	±3dB	15	13 dBm	±3dB	8	27 dBm	±3dB	16	11 dBm	±5dB	9	25 dBm	±3dB	17	9 dBm	±5dB	10	23 dBm	±3dB	18	7 dBm	±5dB	11	21 dBm	±3dB	19	5 dBm	±5dB	12	19 dBm	±3dB			
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## 2. PERFORMANCE

Item	Description	Specification	
5	Output RF Spectrum (due to modulation)	<b>GSM, EGSM</b>	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600 ~ 1,200	-60
		1,200 ~ 1,800	-60
		1,800 ~ 3,000	-63
		3,000 ~ 6,000	-65
		6,000	-71
		<b>DCS, PCS</b>	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600 ~ 1,200	-60
		1,200 ~ 1,800	-60
		1,800 ~ 3,000	-65
		3,000 ~ 6,000	-65
		6,000	-73
6	Output RF Spectrum (due to switching transient)	<b>GSM, EGSM</b>	
		Offset from Carrier (kHz)	Max. (dBm)
		400	-19
		600	-21
		1,200	-21
		1,800	-24

## 2. PERFORMANCE

Item	Description	Specification		
6	Output RF Spectrum (due to switching transient)	<b>DCS, PCS</b>		
		Offset from Carrier (kHz).		Max. (dBm)
		400		-22
		600		-24
		1,200		-24
		1,800		-27
7	Spurious Emissions	Conduction, Emission Status		
8	Bit Error Ratio	<b>GSM, EGSM</b> BER (Class II) < 2.439% @-102 dBm		
		<b>DCS, PCS</b> BER (Class II) < 2.439% @-100 dBm		
9	RX Level Report Accuracy	$\pm 3$ dB		
10	SLR	$8 \pm 3$ dB		
11	Sending Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	-
		200	0	-
		300	0	-12
		1,000	0	-6
		2,000	4	-6
		3,000	4	-6
		3,400	4	-9
		4,000	0	-
12	RLR	$2 \pm 3$ dB		
13	Receiving Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	-
		200	0	-
		300	2	-7
		500	*	-5
		1,000	0	-5
		3,000	2	-5
		3,400	2	-10
		4,000	2	
		* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.		

## 2. PERFORMANCE

Item	Description	Specification	
14	STMR	$13 \pm 5$ dB	
15	Stability Margin	> 6 dB	
16	Distortion	dB to ARL (dB)	Level Ratio (dB)
		-35	17.5
		-30	22.5
		-20	30.7
		-10	33.3
		0	33.7
		7	31.7
		10	25.5
17	Side Tone Distortion	Three stage distortion < 10%	
18	System frequency (13 MHz) tolerance	$\leq 2.5$ ppm	
19	32.768KHz tolerance	$\leq 30$ ppm	
20	Ringer Volume	At least 65 dBspl under below conditions: 1. Ringer set as ringer. 2. Test distance set as 50 cm	
21	Charge Current	Fast Charge : < 430 mA Slow Charge : < 160 mA	
22	Antenna Display	Antenna Bar Number	Power
		5	-85 dBm ~
		4	-90 dBm ~ -86 dBm
		3	-95 dBm ~ -91 dBm
		2	-100 dBm ~ -96 dBm
		1	-105 dBm ~ -101 dBm
		0	~ -105 dBm
23	Battery Indicator	Battery Bar Number	Voltage
		0	3.36 ~ 3.54 V
		1	3.55 ~ 3.66 V
		2	3.67 ~ 3.72 V
		3	3.73 ~ 3.84 V
		4	3.85 V ~
24	Low Voltage Warning	$3.55 \pm 0.03$ V (Call)	
		$3.48 \pm 0.03$ V (Standby)	

## 2. PERFORMANCE

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Item	Description	Specification
25	Forced shut down Voltage	$3.35 \pm 0.03$ V
26	Battery Type	1 Li-Poly Battery Standard Voltage = 3.7 V Battery full charge voltage = 4.2 V Capacity: 800mAh
27	Travel Charger	Switching-mode charger Input: 100 ~ 240 V, 50/60 Hz Output: 5.2 V, 800 mA

### 3. TECHNICAL BRIEF

#### 3.1 Power Transceiver (SKY74400, U602)

The RF parts consist of a transmitter part, a receiver part, a frequency synthesizer part, a voltage supply part, and a VCTCXO part.

The SKY74400 power transceiver is a highly integrated device for quad-band Global System for Mobile Communications (GSM), General Packet Radio Service (GPRS), and Enhanced Data for GSM Evolution (EDGE) handsets. The device supports GSM850, EGSM900, DCS1800, and PCS1900 applications.

The power transceiver consists of a direct conversion receiver and power amplifier (PA) with an integrated PA Control (iPAC) function, fully integrated into a single module. All RF inputs and outputs of the device are fully matched to 50  $\Omega$ .

The receiver path implements a direct down-conversion architecture that eliminates the need for Intermediate Frequency (IF) components. Four integrated Low Noise Amplifiers (LNAs) are internally matched to 50  $\Omega$ , which eliminates the need for external matching components. The receiver path also contains a quadrature demodulator, selectable receiver baseband filter bandwidths, low droop DC-offset correction sequencer, and integrated 2nd order Intercept Point (IP2) calibration circuitry.

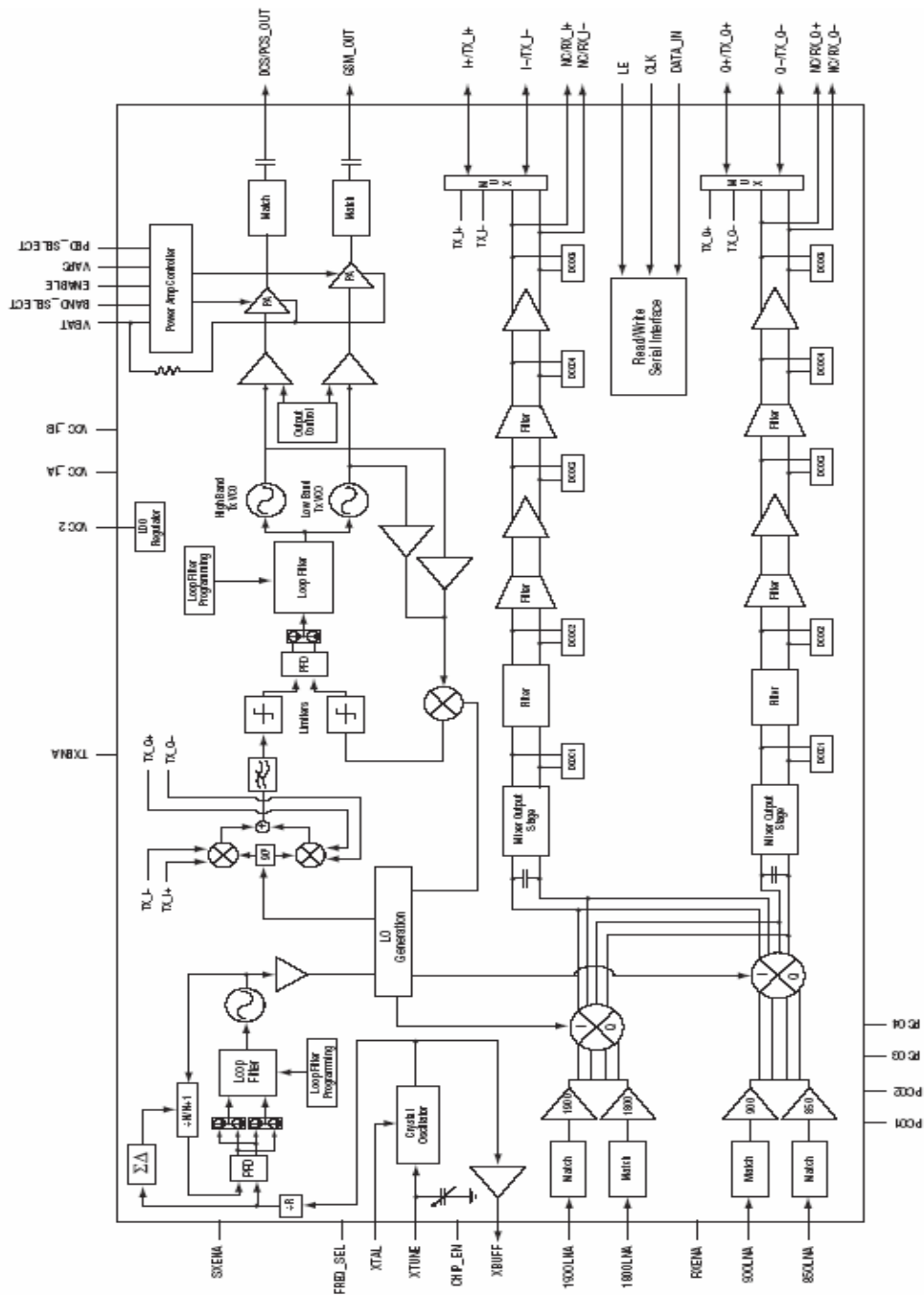
The SKY74400 also features an integrated, fully programmable, sigma-delta fractional-N synthesizer suitable for EGPRS multi-slot operation. The reference frequency for the synthesizer is supplied by an integrated Voltage Controlled Crystal Oscillator (VCXO) circuit that enables the use of a low-cost crystal.

The VCXO also provides a buffered output to supply other devices in the system.

The transmit path uses a translation loop architecture. This architecture consists of an In-phase and Quadrature (I/Q) modulator and a frequency translation loop to perform frequency up-conversion with high spectral purity. The translation loop also contains a phase-frequency detector, charge pump, mixer, programmable dividers, and high power transmit Voltage Controlled Oscillators (VCOs) with no external tank required. The transmit loop is directly connected to the PA section of the power transceiver, which consists of separate GSM850/EGSM900 and DCS1800/PCS1900 blocks fabricated on a single GaAs Heterojunction Bipolar Transistor (HBT) die, impedance matching circuitry for 50  $\Omega$  output, and a custom BiCMOS PA control block with an internal current-sense resistor.

- Receive section. Includes four integrated LNAs with 50  $\Omega$  inputs, quadrature demodulator circuitry that performs direct down-conversion, baseband amplifier circuitry with I/Q outputs, baseband filter with programmable bandwidths, five stages of DC offset correction, and IP2 calibration circuitry.
- Synthesizer section. Includes an integrated VCO locked by a fractional-N synthesizer loop, a crystal oscillator to supply the reference frequency, a reference frequency output buffer, and an integrated loop filter.
- Transmit section. The transmit section is designed with a translation loop architecture that consists of an I/Q modulator, integrated high power VCOs, offset mixer, programmable divider, Phase/Frequency Detector (PFD), charge pump, and loop filter. The transmit section also includes a PA for GSM850/EGSM900 and DCS1800/PCS1900 operation with common power supply pins, 50  $\Omega$  output impedance matching circuitry, and a Power Amplifier Controller (PAC) block with an internal current-sense resistor.

### 3. TECHNICAL BRIEF



**Figure. 3-1 SKY74400 FUNCTIONAL BLOCK DIAGRAM**

## (1) Receiver Part

### A. LNA and Quadrature Demodulator

Four separate LNAs are integrated in the SKY74400 to address different bands of operation. These LNAs have separate singleended 50  $\Omega$  inputs. The LNA gain is switchable between high and low settings using the three-wire bus. The LNA outputs feed into a quadrature demodulator that downconverts the RF signals directly to baseband. The baseband I and Q paths consist of cascaded amplifiers and low pass filter sections. The baseband section provides eight programmable bandwidth settings ranging between 90 kHz and 160 kHz to allow for added flexibility when interfacing to any mixed signal baseband device.

No external capacitors are required for baseband filtering. The filter chain consists of two fixed real poles, two fixed conjugate pole pairs, and one programmable conjugate pole pair. The result is a flat passband with minimal group delay distortion at any bandwidth setting.

### B. DC Offset Correction

Five DC offset correction loops ensure that DC offsets generated in the SKY74400 do not overload the baseband chain at any point. After correction, the corrected voltages are held digitally for the duration of the receive slot(s). The positive edge of the RXENA signal starts the digital DC offset correction. Since the correction is digital, a system clock is required.

To generate the clock, the reference frequency is divided down internally. A special, fast DC offset correction is carried out every time the receiver gain is programmed while RXENA is high. This ensures that a DC offset correction is complete in the time available, even if the gain is changed between slots in multislot mode.

### C. AM Suppression and IP2 Calibration

For direct conversion GSM applications, it is imperative to have extremely low second-order distortion. Mathematically, secondorder distortion of a constant tone generates a DC term proportional to the square of the amplitude. In general, a strong interfering Amplitude Modulated (AM) signal is, therefore, demodulated by second-order distortion, which generates an Acinterfering baseband signal. The SKY74400 can effectively handle such AM-modulated interferers. A commonly used measure for receiver second-order distortion is the second-order intercept point, IP2. For example,

to ensure that the unwanted baseband signals are 9 dB below the wanted signal required under the AM suppression test for type approval (see 3GPP TS 51.010-1), an input IP2 of 43 dBm is required. The SKY74400 RF transceiver includes a circuit that minimizes second-order distortion. This IP2 calibration circuit effectively compensates for any second-order distortion in the receive chain that would otherwise generate unwanted baseband signals in the presence of strong interfering signals. When calibrated correctly, the SKY74400 IP2 meets the GSM AM suppression test requirements in all bands with good margin.

A one-time factory calibration procedure produces a set of I/Q compensation coefficients that are programmed in the device to minimize the DC voltage shift resulting from the second-order distortion. The IP2 performance is optimized when the DC due to the interfering signal is minimized.

The determined coefficients are transmitted to the serial interface, stored in nonvolatile memory, and programmed to the SKY74400 upon each power-up as part of device initialization. The optimization process is performed internal to the SKY74400.



### 3. TECHNICAL BRIEF

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#### D. Flexible Receiver Bandwidth Control

The receive baseband filters have programmable bandwidths with eight possible settings.

#### (2) Synthesizer Section

The SKY74400 includes a fully integrated UHF VCO and 3rd order loop filter. A single sigma-delta fractional-N synthesizer phaselocks the Local Oscillator (LO) used in both transmit and receive paths to a precision frequency reference input. Fractional-N operation offers low phase noise and fast settling times, allowing for multiple slot applications such as GPRS.

The SKY74400 frequency stepping function with a 3 Hz resolution allows quad band operation in both transmit and receive bands using a fully integrated UHF VCO. The fine synthesizer resolution allows direct compensation or adjustment for reference frequency errors.

The generated frequency is given by the following equation:

$$f_{VCO} = \frac{\left( N + 3.5 + \frac{FN}{2^{22}} \right) f_{ref}}{R}$$

where:  $f_{VCO}$  = Generated VCO frequency

N = N-divider ratio, integer part

FN = Fractional setting

R = R-divider ratio

$f_{ref}$  = Reference frequency

#### A. UHF VCO Frequency Setting

To tune the receiver's receive frequency ( $f_{RX}$ ), the VCO frequency ( $f_{VCO}$ ) is set according to the following equations:

$$\text{GSM850/EGSM900: } f_{VCO} = \frac{3}{2} f_{RX}$$

$$\text{DCS1800/PCS1900: } f_{VCO} = \frac{3}{4} f_{RX}$$

#### B. Digital Frequency Centering

The SKY74400 re-centers the UHF VCO frequency range each time the synthesizer is programmed. This proprietary Skyworks technique, called Digital Frequency Centering (DFC) extends the VCO frequency coverage, speeds up settling time, and ensures robust performance since the VCO is always operated at the center of its tuning range. Each time the synthesizer is programmed, the DFC circuit is activated and the VCO is centered to the programmed frequency in less than 20  $\mu$ s. After this, normal Phase Locked Loop (PLL) operation is resumed and the fine settling of the frequency is finalized. DFC typically adjusts the VCO center frequency to within a few MHz and no more than 5 MHz offset, and presets the tuning voltage to the center of the range before the PLL takes over.

This speeds up frequency settling and ensures that the PLL control voltage never operates close to the rails. DFC is the result of an adaptive circuit that corrects for any VCO center frequency errors caused by variations of the integrated VCO circuit such as temperature, supply voltage, or aging. The VCO can be centered at any frequency in the range from 990 MHz to 1550 MHz. Once centered, the VCO has a minimum analog tuning range of 20 MHz. No calibration or data storage is needed for DFC operation. It is activated by one of two events:

- When the synthesizer is programmed, the rising edge of the LE signal starts the DFC cycle
- When the SXENA signal level is changed from low to high, which enables the synthesizer, the rising edge of the SXENA signal starts the DFC cycle.

#### C. Integrated Loop Filters

Both loop filters (for the UHF PLL and for the transmit PLL) are fully integrated. Several adjustments can be made to the loop filter transfer functions. The UHF loop filter has two synchronized charge pumps. The frequency of the “zero” factor (z1) in the PLL phase transfer function can be adjusted by varying the charge pump currents, and the values of the internal R3 resistor and C3 capacitor.

**Charge Pump Current Compensation for Constant PLL Bandwidth** The VCOs in the SKY74400 use Skyworks DFC technique. The nature of the DFC circuit increases the VCO control sensitivity (KVCO) as the VCO frequency is increased. Without any compensation, this leads to an increase in the PLL loop gain and an increased loop bandwidth for higher frequencies. In a classical PLL design, KVCO is typically regarded as a constant. In this case, the loop gain decreases with increased frequency as the division ratio of the loop is increased proportionally to frequency. Since it is usually desirable to keep the loop bandwidth constant over the frequency range of interest, the SKY74400 includes a circuit that compensates the charge pump current to keep the overall loop gain constant. Charge pump current compensation for the UHF PLL can be programmed to one of three settings (nominal, high, or low) or the charge pump current can be programmed to a constant value without compensation. Refer to the Skyworks Programming Guide SKY74117 RF Transceiver for Standalone Devices or Embedded MCMs for details.

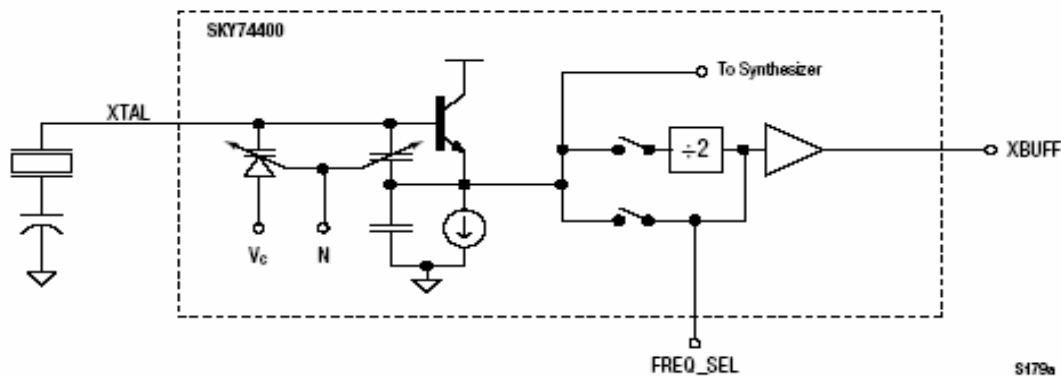
#### D. Crystal Oscillator

A 26 MHz crystal oscillator provides the reference frequency for the synthesizer. the oscillator uses an external 26 MHz crystal to generate an accurate oscillation frequency. The reference frequency can be changed through coarse-tuning with an integrated capacitor array or fine-tuning with the integrated varactor diode. The oscillator is coarse-tuned by switching in and out (using a digital word programmed with the serial interface) the capacitor network (CAP\_A and CAP\_B) located at the input of the integrated buffer. The oscillator is fine-tuned by providing a tuning voltage to the integrated varactor diode.

An output buffer is provided to drive the baseband circuitry. The frequency of the output is determined by the FREQ\_SEL signal. When this signal is connected to ground, the output is 13 MHz; when connected to VCC or left floating, the output is 26 MHz. The oscillator core powers up when the SXENA signal is set to logic 1.

### 3. TECHNICAL BRIEF

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**Figure. 3-2 Crystal Oscillator BLOCK DIAGRAM**

#### **(3) Transmitter Part**

To minimize the post-PA filtering requirements and any additional post-power amp losses, the transmit path consists of a vector modulator and a frequency translation loop. The translation loop consists of the following:

- PFD and charge pump
- In-loop modulator
- One programmable divider
- Integrated transmit loop filter
- Two transmit VCOs and output buffers

##### **A. Translation Loop**

The translational loop includes a vector modulator and a frequency translation loop to minimize the post-PA filtering requirements. the loop functions as a PLL with a mixer in the feedback path and a modulator in the reference path. The loop provides a PFD and charge pump, integrated loop filters, two transmit VCOs, down-conversion mixer in the feedback path, a frequency divider for frequency plan flexibility, and the modulator. The mixers in the feedback path provide either high side or low side injection to provide flexibility in the frequency plan. The modulator in the reference path uses a vector summing technique to reject the unwanted image and to also sufficiently attenuate the 3rd and 5th harmonics. Therefore, no external IF filters are required. The loop filter required for the transmit VCOs is integrated in the SKY74400.

##### **B. Transmit VCOs**

Two integrated transmit VCOs are designed to meet GSM850, EGSM900, DCS1800, and PCS1900 requirements. The transmit VCOs use the same DFC technique as the synthesizer section to lock the translation loop. The rising edge on TXENA initializes the transmit DFC. The output buffers feed the signal to the PAs. Two transmit buffers are provided, one for the low band VCO and the other for the high band VCO.

#### **C. Power Amplifier (PA)**

The PA functionality of the SKY74400 consists of separate GSM850/EGSM900 and DCS1800/PCS1900 blocks, impedancematching circuitry for 50  $\Omega$  output impedances, and a PAC block with an internal currentsense resistor. The custom BiCMOS integrated circuit provides the internal PAC function and interface circuitry. Fabricated onto a single Gallium Arsenide (GaAs) die, one Heterojunction Bipolar Transistor (HBT) PA block supports the GSM850 and EGSM900 bands, and the other supports the DCS1800 and PCS1900 bands. Both PA blocks share common power supply pins to distribute current. The RF output ports of the SKY74400 are internally matched to a 50  $\Omega$  load to reduce the number of external components for a quad-band design. The PA also contains band-select switching circuitry to select GSM (logic 0) or DCS/PCS (logic 1) as determined from the BAND\_SELECT signal. The VBAT pin connects to an internal current-sense resistor and interfaces to an iPAC function, which is insensitive to variations in temperature, power supply, and process.

The ENABLE input allows initial power-on of PA circuitry to minimize battery drain.

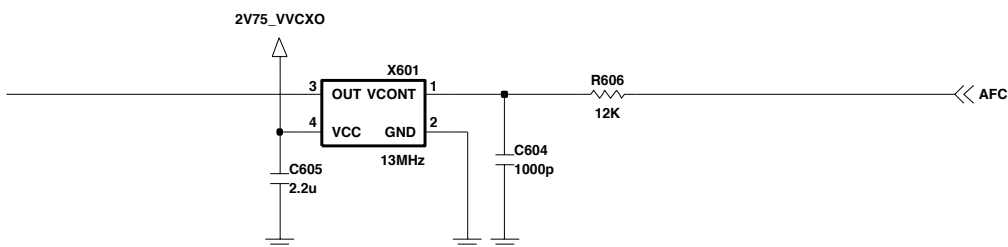
#### **(4) Low Drop-Out (LDO) Linear Voltage Regulators**

The SKY74400 includes integrated LDO linear voltage regulators to eliminate the need for a separate power management integrated circuit or discrete voltage regulators. Each functional block in the SKY74400 includes a separate, internal LDO voltage regulator.

### 3. TECHNICAL BRIEF

#### 3.2 13 MHz Clock (VCTCXO, X601)

The 13 MHz clock(X601) consists of a TCXO(Temperature Compensated Crystal Oscillator) which oscillates at a frequency of 13 MHz. It is used within the SKY74400, analog base band chipset (U101, AD6535), digital base band chipset (U103, AD6527B).



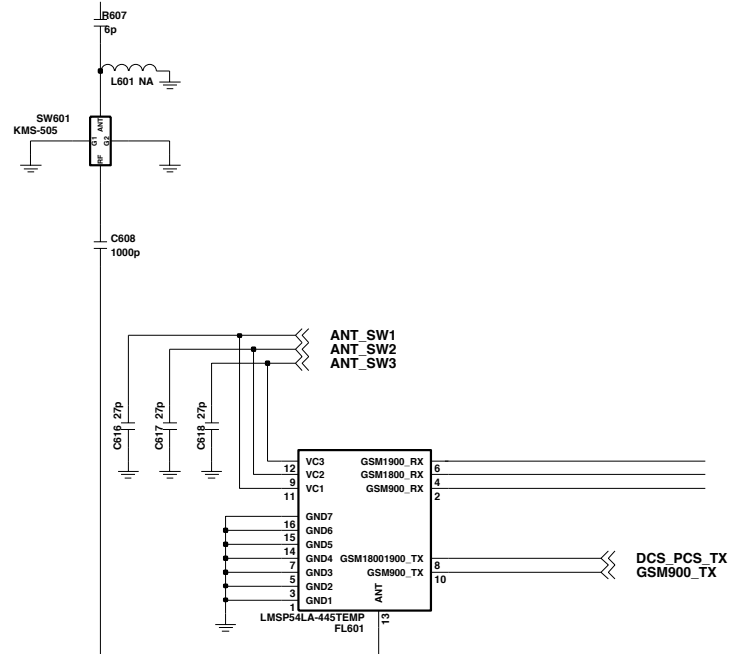
**Figure 3-3 VCTCXO CIRCUIT DIAGRAM**

#### 3.3 Switchplexer for Triband(FL601)

	Vc1	Vc2	Vc3	Current
EGSM-Tx	0.0-0.1V	0.0-0.1V	2.3-3.0V	10mA Max
EGSM-Rx	0.0-0.1V	0.0-0.1V	0.0-0.1V	≈ 0mA
DCS/PCS-Tx	0.0-0.1V	2.3-3.0V	0.0-0.1V	10mA Max
DCS-Rx	0.0-0.1V	0.0-0.1V	0.0-0.1V	≈ 0mA
PCS-Rx	2.3-3.0V	0.0-0.1V	0.0-0.1V	10mA Max

**Table 3-1 FEM CONTROL LOGIC**

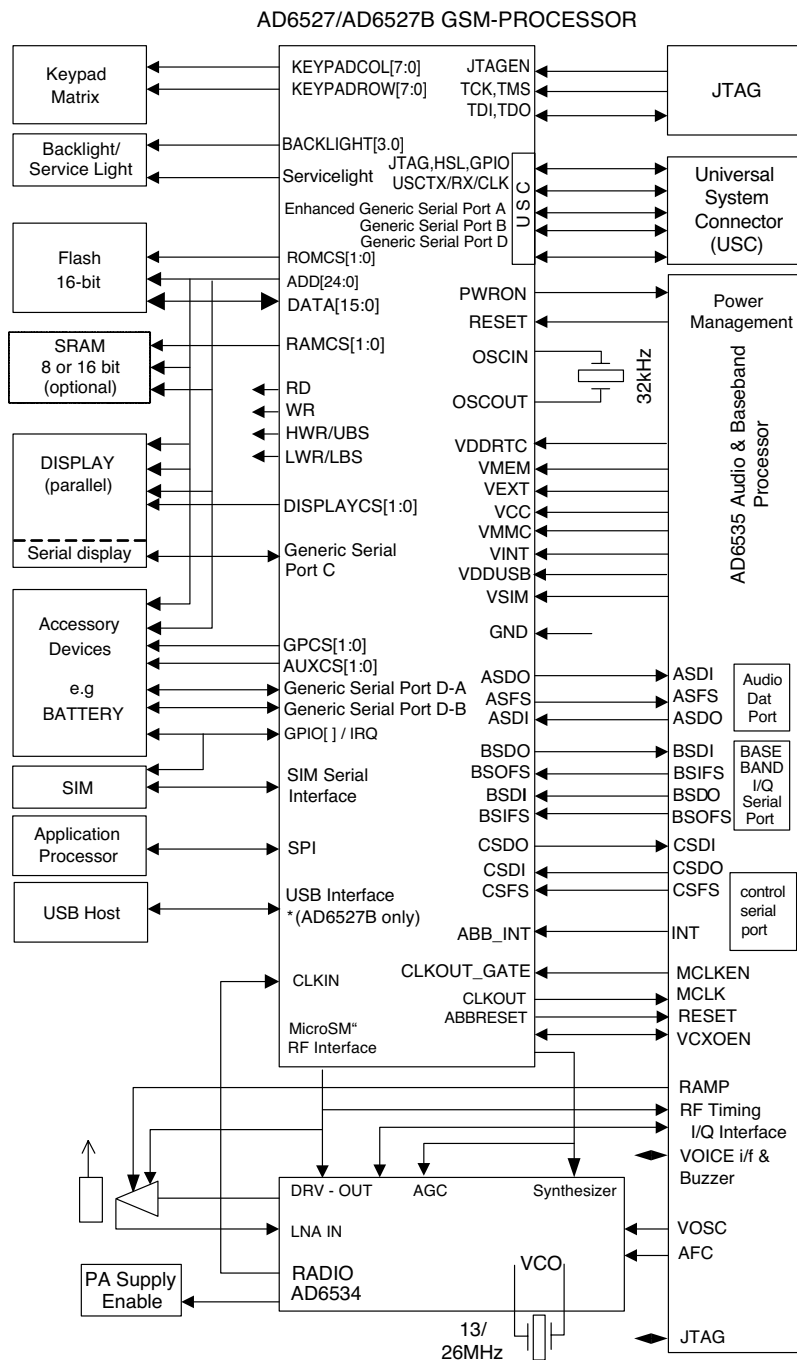
### 3. TECHNICAL BRIEF



**Figure 3-4 FEM CIRCUIT DIAGRAM**

### 3. TECHNICAL BRIEF

#### 3.4 Digital Main Processor (AD6527B, U103)



**Figure 3-5. SYSTEM INTERCONNECTION OF AD6527 EXTERNAL INTERFACE**

- AD6527 is an ADI designed processor.

- AD6527 consists of

1. Control Processor Subsystem

- 32-bit ARM7TDMI Control Processor
- 58.5 MHz operation at 1.7V
- On-board 16KB instruction/Data Cache
- 1 Mbits of on-chip System SRAM

2. DSP Subsystem

- 16-bit Fixed Point DSP Processor
- 91 MIPS at 1.7V
- 16K word Data and 16K word Program SRAM
- 4K word Program Instruction Cache
- Architecture supports Full Rate, Enhanced Full Rate, Half Rate, and AMR Speech Encoding/Decoding Algorithms

3. Peripheral Subsystem

- Shared on-chip peripheral and off-chip interface:
- Support for Burst and Page Mode Flash
- Support for Pseudo SRAM
- Ciphering module for GPRS supporting GAE1 and GAE2 encryption algorithms
- Parallel and Serial Display Interface
- 8 x 8 Keypad Interface
- Four independent programmable backlight plus One Service Light
- 1.8V and 3.0V, 64 kbps SIM interface
- Universal System Connector Interface
- Slow, Medium and Fast IrDA transceiver interface
- Enhanced Generic Serial Port
- Dedicated SPI interface
- Thumbwheel Interface
- JTAG Interface for Test and In-Circuit Emulation

4. Other

- Supports 13 MHz and 26 MHz Input Clocks
- 1.8V Typical Core Operating Voltages
- 204-Ball LFBGA(mini-BGA) Package

5. Applications

- GSM900/DCS1800/PCS1900/PCS850 Wireless Terminals
- GSM Phase 2+ Compliant
- GPRS Class 12 Compliant
- Multimedia Services(MMS)
- Extended Messaging System(EMS)



### 3. TECHNICAL BRIEF

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#### 3.4.1 Interconnection with external devices

##### A. RTC block interface

Countered by external X-TAL  
The X-TAL oscillates 32.768KHz

##### B. LCD module interface

The LCD module is controlled by AD6527B(U103),DBB.  
In operating mode, the AD6527B(U103) controls the LCD module through \_LCD\_CS, LCD\_DIM\_CTRL, LCD\_RESET, \_WR, 2V8\_VMEM, LCD\_ID, LCD\_BL\_EN.

Signals	Description
_LCD_CS	MAIN LCD driver chip enable. MAIN LCD driver IC has own CS pin
LCD_DIM_CTRL	It controls dimming mode of LCD module.(GPIO_5)
LCD_RESET (GPIO 15)	This pin resets LCD module. This signal comes from DBB directly.
_WR	Enable writing to LCD Driver.
2V8_VMEM	2.8V voltage is supplied to LCD driver IC.
LCD_ID(GPIO_16)	It determines the maker of LCD module.
LCD_BL_EN	It controls back-light of LCD module.(GPO_23)

**Table 3-2. LCD CONTRON SIGNALS DISCRIPTION**

### 3. TECHNICAL BRIEF

The backlight of LCD module is controlled by DBB via AAT2806IXN-4.5-T1 , U402. The control signals related to Backlight LED are given bellow.

Signals	Description
LCD_DIM_CTL (GPO 5)	Control LCD backlight level in 16 steps
LCD_LED_CTL	Control LCD LED
LCD_LED_GND	
LCD_BL_EN	It controls back-light of LCD module.(GPO_23)

**Table 3-3. DESCRIPTION OF LCD BACKLIGHT LED CONTROL**

#### **C. RF interface**

The AD6527B control RF parts through PA\_BAND, ANT\_SW1, ANT\_SW2, ANT\_SW3 , CLKON , PA\_EN, S\_EN, S\_DATA, S\_CLK, RF\_PWR\_DWN.

Signals	Description
PA_BAND (GPO 17)	PAM Band Select
ANT_SW1 (GPO 9)	Antenna switch Band Select
ANT_SW2 (GPO 10)	Antenna switch Band Select
ANT_SW3 (GPO 11)	Antenna switch Band Select
CLKON	RF LDO Enable/Disable
PA_EN (GPO 16)	PAM Enable/Disable
S_EN (GPO 19)	PLL Enable/Disable
S_DATA (GPO 20)	Serial Data to PLL
S_CLK (GPO 21)	Clock to PLL
RF_PWR_DWN(GPO 4)	Power down Input

**Table 3-4. RF CONTRON SIGNALS DISCRIPTION**

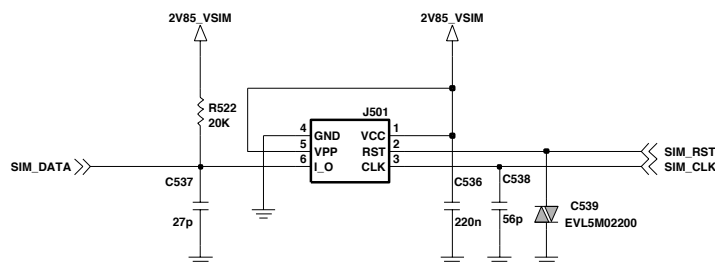
### 3. TECHNICAL BRIEF

#### D. SIM interface

The AD6527B provides SIM Interface Module. The AD6527 checks status periodically during established call mode whether SIM card is inserted or not, but it doesn't check during deep Sleep mode. In order to communicate with SIM card, 3 signals SIM\_DATA, SIM\_CLK, SIM\_RST(GPIO\_23) are required. The descriptions about the signals are given by bellow Table 3-6 in detail.

Signals	Description
SIM_DATA	This pin receives and sends data to SIM card. This model can support only 3.0 volt interface SIM card.
SIM_CLK	Clock 3.25MHz frequency.
SIM_RST (GPIO_23)	Reset SIM block

**Table 3-5. SIM CONTRON SIGNALS DISCRIPTION**



**Figure 3-6. SIM Interface of AD6527B**

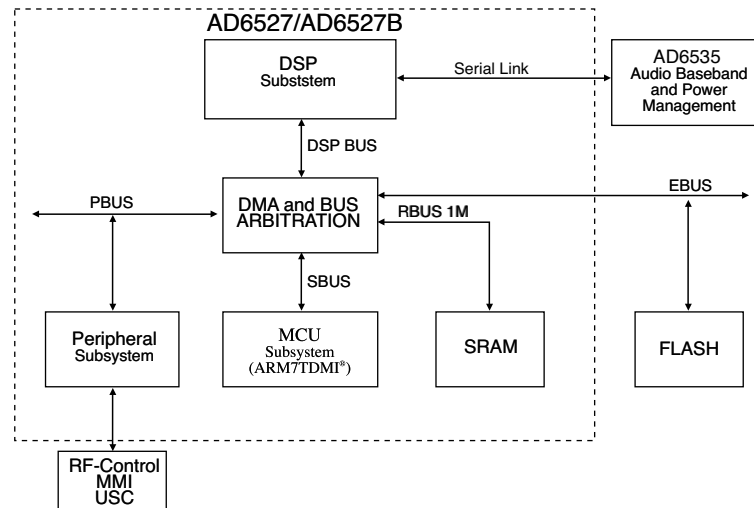
#### E. Key interface

Include 5 column , 5 row and additional GPIO 35 for KEY\_ROW5. The AD6527B detects whether key is pressed or not by using interrupt method.

#### F. AD6535 Interrupt

AD6535 provides an active-high interrupt output signal. Interrupt signals are generated by the Auxiliary ADC, audio, and charger modules.

### 3.4.2 AD6527B Architecture



**Figure 3-7. AD6527B Architecture**

The internal architecture of AD6527B is shown above Figure 3-7. AD6527 regroups three main subsystems connected together through a dynamic and flexible communication bus network. It also includes onboard system RAM (SRAM) and interfaces with external Flash Memory, Baseband converter functions, and terminal functions like MMI, SIM and Universal System Connector (USC).

The Digital Signal Processing (DSP) subsystem primarily hosts all the speech processing, channel equalization and channel codec functions. The code used to implement such functions can be stored in external Flash Memory and dynamically downloaded on demand into the DSP's program RAM and Instruction Cache.

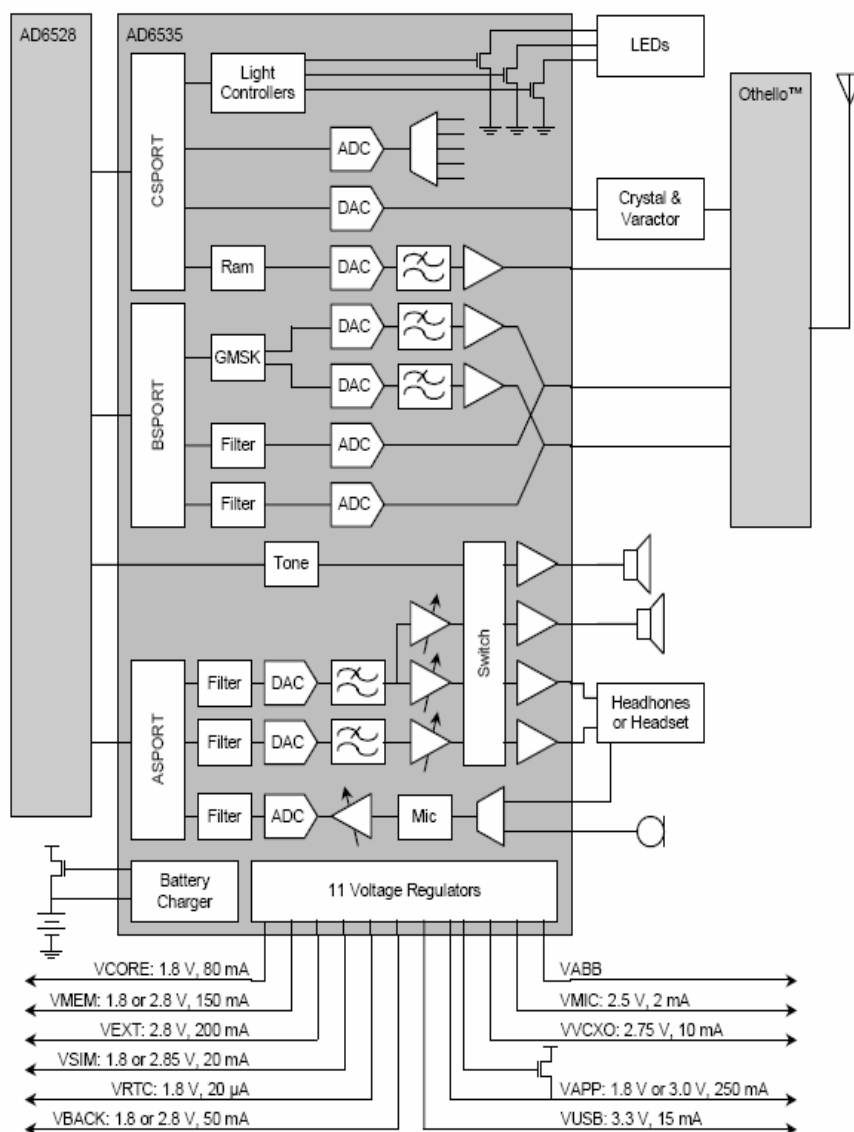
The micro-controller subsystem supports all the GSM terminal software, including the layer 1, 2 and 3 of the GSM protocol stack, the MMI, and applications software such as data services, test and maintenance. It is tightly associated with on-chip system SRAM and also includes boot ROM memory with a small dedicated routine to facilitate the initialization of the external Flash Memory via code download using the on-chip serial interface to the external Flash Memory interface.

The peripheral subsystem is composed of system peripherals such as interrupt controller, real time clock, watch dog timer, power management and a timing and control module. It also includes peripheral interfaces to the terminal functions: keyboard, battery supervision, radio and display. Both the DSP and the MCU can access the peripheral subsystem via the peripheral bus (PBUS).

For program and data storage, both the MCU subsystem and the DSP subsystem can access the on chip system SRAM and external memory such Flash Memory. The access to the SRAM module is made through the RAM Bus (RBUS) under the control of the bus arbitration logic. Similarly, access to the Flash Memory is through the parallel External Bus (EBUS).

### 3. TECHNICAL BRIEF

#### 3.5 Analog Main & Power Management Processor (AD6535, U101)



**Figure 3-8. AD6535 FUNCTIONAL BLOCK DIAGRAM**

- AD6535 is an ADI designed Analog Baseband processor. AD6535 covers the processing GMSK modulation interface, Aux ADC, Voice signal processing and Power Management.

- AD6535 consists of

1. BB Transmit section

- GMSK Modulation
- I-channel & Q-channel Transmit DACs and Filters
- Power Ramping DAC

2. BB Receive section

- I-channel & Q-channel Receive ADCs and Filters

3. Auxiliary section

- Voltage Reference
- Automatic Frequency Control DAC
- Auxiliary ADC
- Light Controllers

4. Audio Section

- 8 kHz & 16 kHz Voiceband Codec
- 48 kHz Monophonic DAC
- Power Amplifiers

5. Power Management section

- Voltage Regulators
- Battery Charger
- Battery Protection

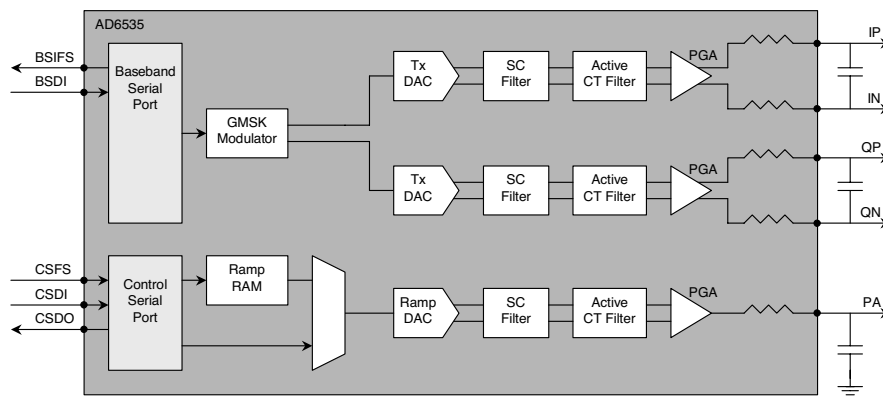
6. Digital Processor section

- Control, Baseband, and Audio Serial Ports
- Interrupt Logic

### 3. TECHNICAL BRIEF

#### 3.5.1 Baseband Transmit Section

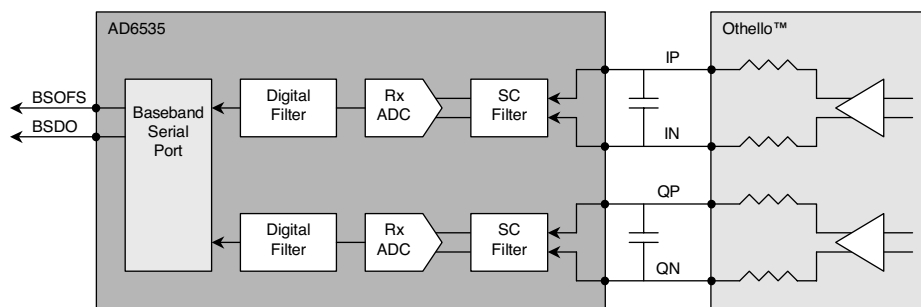
1. The AD6537B Baseband Transmit Section is designed to support GMSK for both single-slot and multi-slot application.
2. The AD6535 includes a digital GMSK modulator which is used for GSM application. The GMSK modulator uses a ROM lookup table to modulate the serial data stream from the BSPORT. The GMSK modulator is based on 3GPP TS 45.004 ver.5.1.0 Release 5



**Figure 3-9. AD6535 BASEBAND TRANSMIT SECTION**

#### 3.5.2 Baseband Receive Section

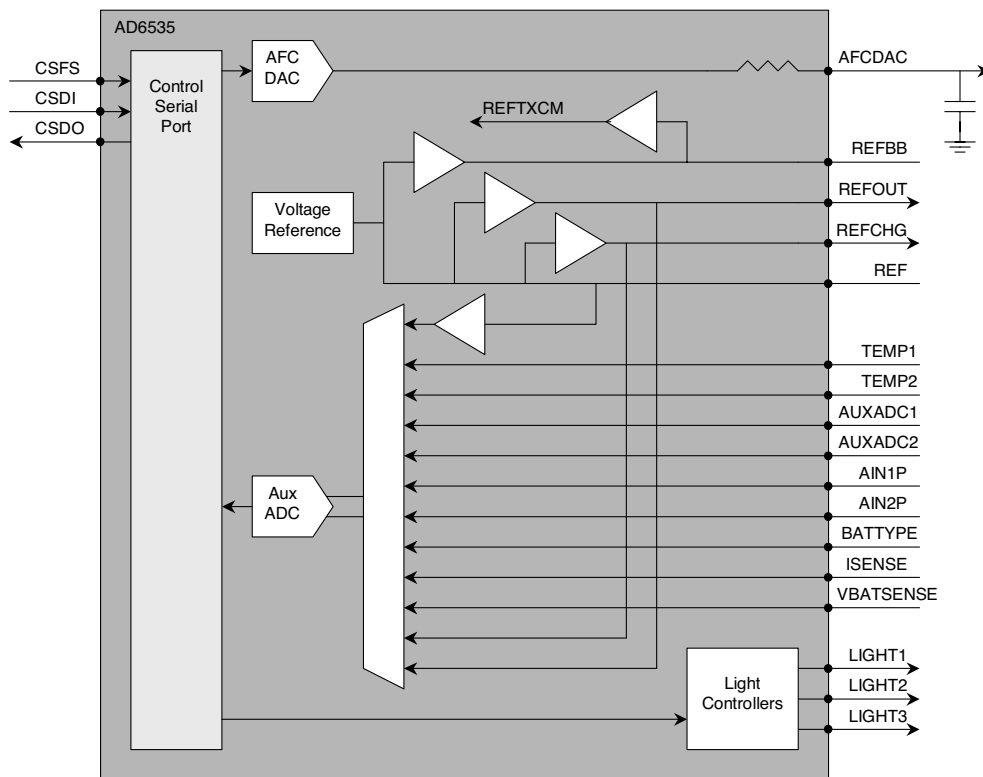
1. This section consists of two identical ADC channels that process baseband in-phase(I) and quadrature(Q) input signals.



**Figure 3-10. AD6535 BASEBAND RECEIVER SECTION**

### 3.5.3 Auxiliary Section

1. This section includes an Automatic Frequency Control(AFC) DAC, voltage reference buffers, an Auxiliary ADC, and light controllers.
  - AFC DAC: 13 bits
2. This section also contains AUX ADC and Voltage Reference
  - IDAC: 10 bits
  - The Auxiliary ADC provides :
    - Two differential inputs for temperature sensing.
    - A differential input for the battery charger current sensor



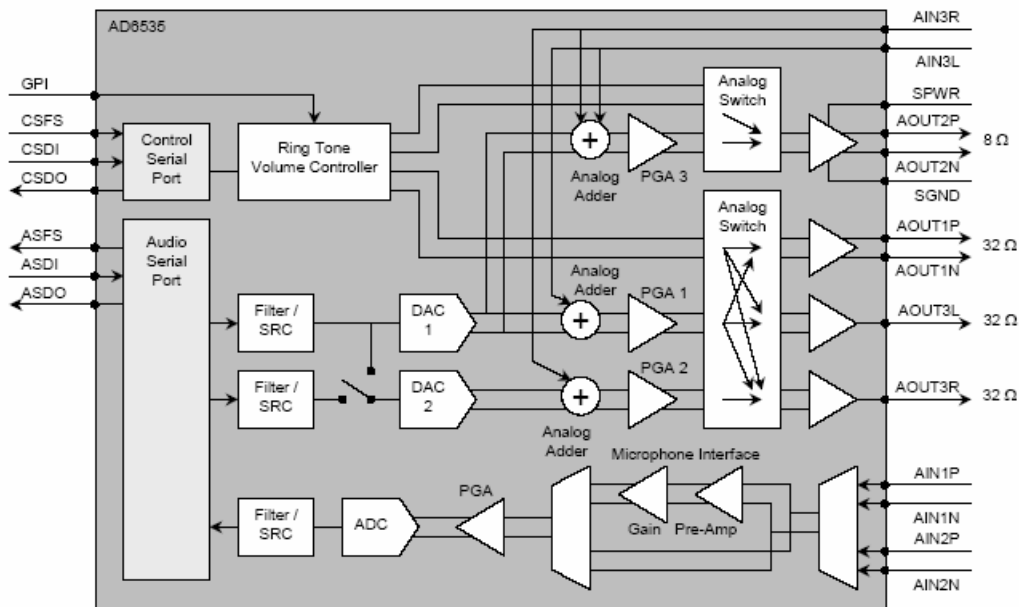
**Figure 3-11. AD6535 AUXILIARY SECTION**



### 3. TECHNICAL BRIEF

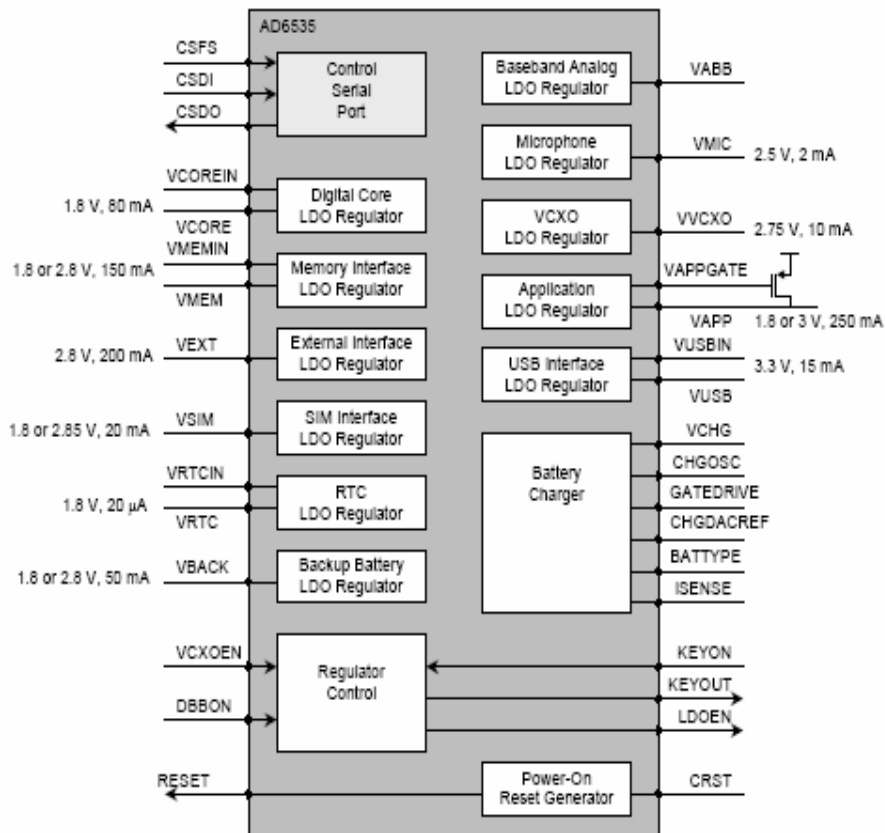
#### 3.5.4 Audio Section

1. The AD6535 Audio section supports communications and personal audio applications.
2. The Audio Section provides an audio codec with two digital-to-analog converter, a ring tone volume controller, a microphone interface, and analog input and output channels.



**Figure 3-12. AD6535 AUDIO SECTION**

### 3.5.5 Power Management

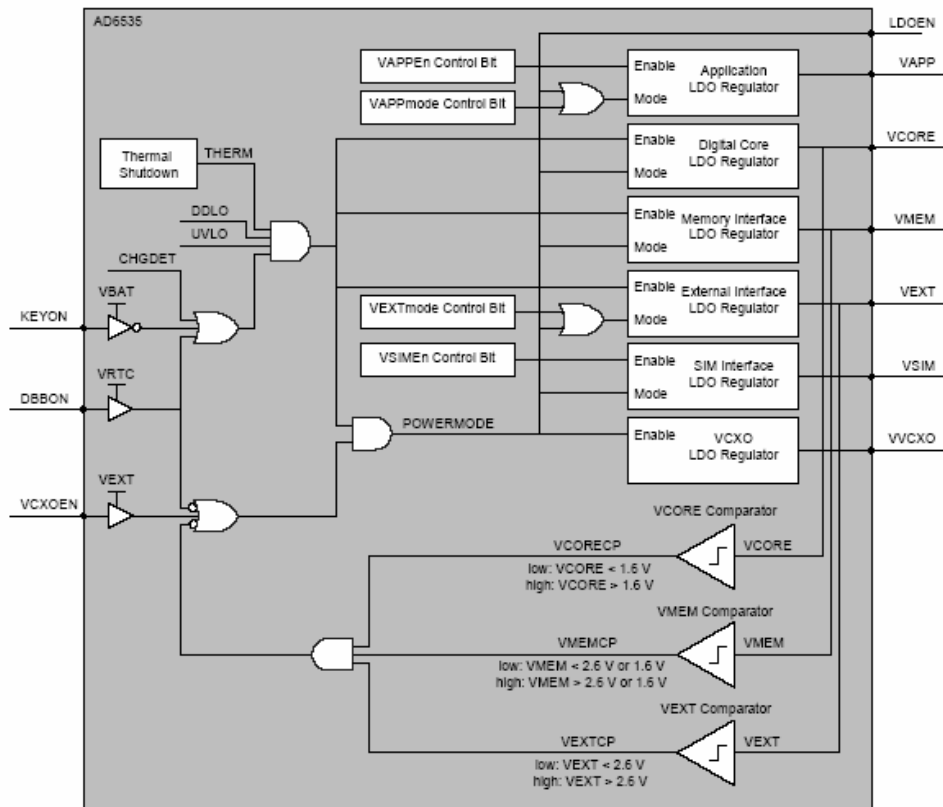


**Figure 3-13. AD6535 POWER MANAGEMENT SECTION**

#### 1. Power up sequence logic

1. The AD6535 controls power on sequence
2. Power on sequence
  - If a battery is inserted, the battery powers the 8 LDOs.
  - Then if PWRONKEY is detected, the LDOs output turn on.
  - REFOUT is also enabled
  - Reset is generated and send to the AD6527B

### 3. TECHNICAL BRIEF



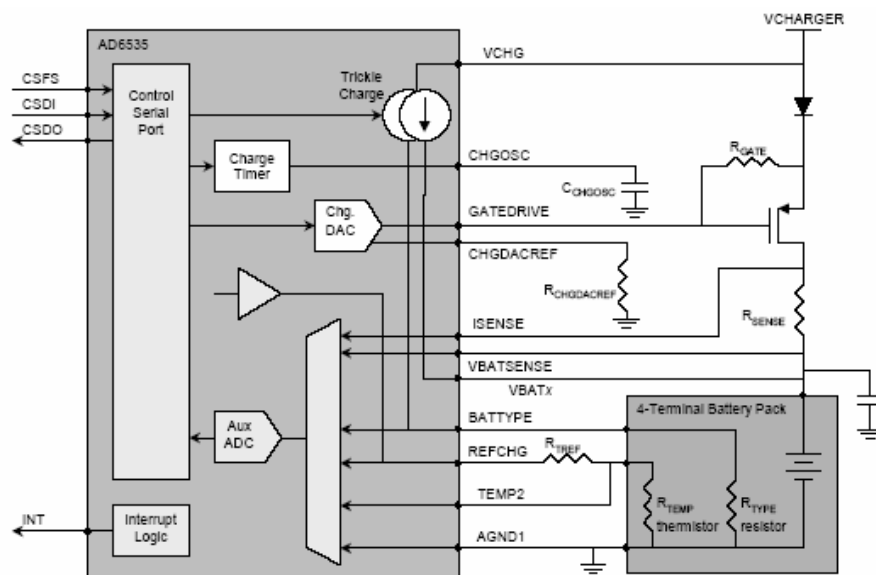
**Figure 3-14. AD6535 POWER MODE LOGIC**

## 2. LDO Block

1. There are 8 LDOs in the AD6535.
  - VCORE : supplies Digital baseband Processor core and AD6535 digital core
  - VMEM : supplies external memory and the interface to the external memory on the digital baseband processor (1.8V or 2.8V, 150mA)
  - VEXT : supplies Radio digital interface and high voltage interface (2.8V, 170mA)
  - VSIM : supplies the SIM interface circuitry on the digital processor and SIM card (2.85V, 20mA)
  - VRTC : supplies the Real-Time Clock module (1.8 V, 20 A)
  - VABB : supplies the analog portions of the AD6537B
  - VMIC : supplies the microphone interface circuitry (2.5 V, 1 mA)
  - VVCXO : supplies the voltage controlled crystal oscillator ( 2.75 V, 10 mA)
  - VBACK : charges the backup battery and supplies the RTC regulator (2.8V, 1.8V)
  - VAPP : supplies application co-processors such as a touch screen digitizer (3.0V, 1.8V)
  - VUSB : supplies the USB interface.

### 3. Battery Charging Block

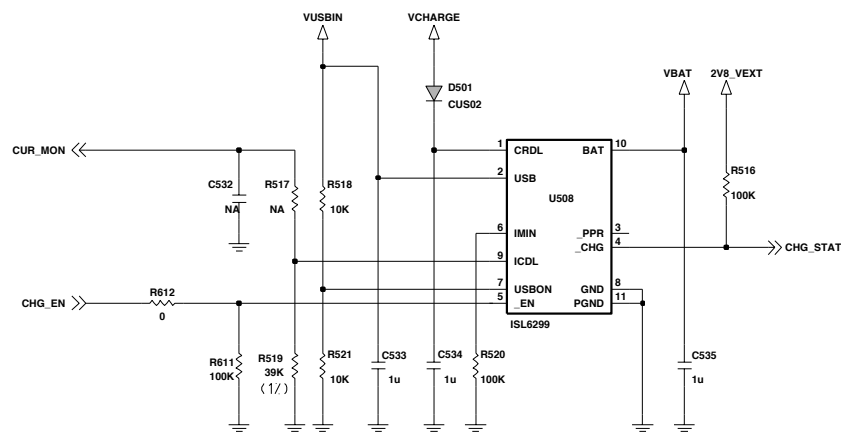
1. It can be used to charge Lithium Ion batteries.  
Charger initialization, trickle charging, and Li-Ion charging control are implemented in hardware.
2. Charging Process
  - Check charger is inserted or not
  - If AD6535 detects that Charger is inserted, the CC-CV charging starts.
  - Exception : When battery voltage is lower than 3.2V, the precharge(low current charge mode) starts firstly.
  - And the battery voltage reach to 3.2V the CC-CV charging starts.
3. Pins used for charging
  - VCHG : charger supply.
  - GATEDRIVE : charge DAC output
  - ISENSE : charge current sense input
  - VBATSENSE : battery voltage sense input.
  - BATTYPE : battery type identification input
  - REFCHG : voltage reference output
4. TA (Travel Adaptor)
  - Input voltage: AC 85V ~ 260V, 50~60Hz
  - Output voltage: DC 5.2V ( 0.2 V )
  - Output current: Max 800mA ( 50mA )
5. Battery
  - Li-ion battery (Max 4.2V, Nom 3.7V)
  - Standard battery: Capacity - 830mAh



**Figure 3-15. AD6535 BATTERY CHARGING BLOCK**

### 3. TECHNICAL BRIEF

#### 3.6 Chargind IC (ISL6299, U508)



**Figure 3-15. CIRCUIT FOR BATTERY CHARGING**

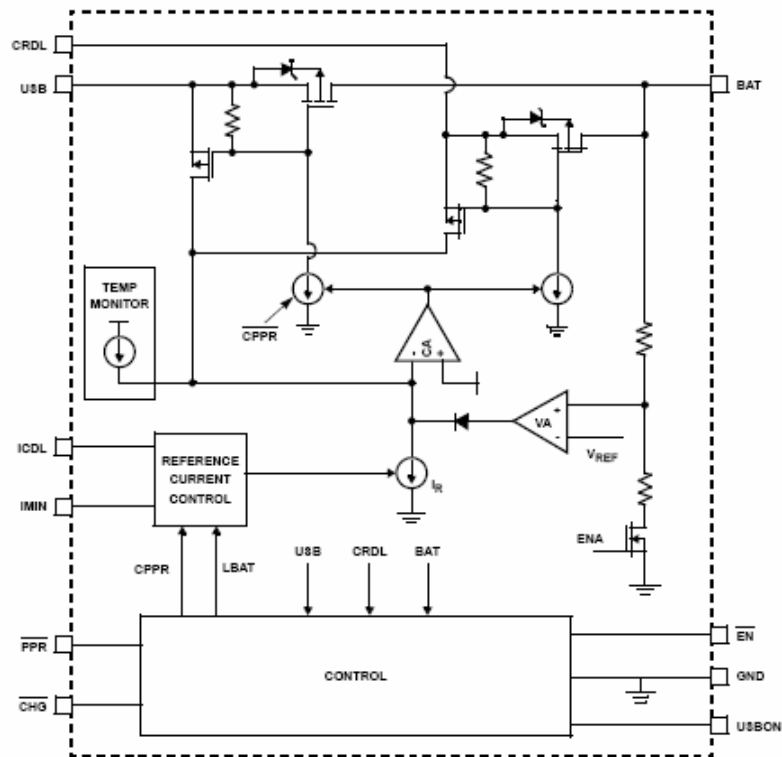
The ISL6299 is designed for a single-cell Li-ion or Li-polymer battery charging circuit that accepts both a USB port and a desktop cradle as its power source.

##### Input Auto Selection

When both input sources are present, the charger selects only one power source to charge the battery. When the CRDL input is higher than the POR threshold, CRDL is selected as the power source. Otherwise the USB input is selected. If the CRDL input voltage is below the battery voltage but the USB input voltage is higher than the battery voltage, then the USB input is used to charge the battery. The control circuit always breaks both internal power devices before switching from one power source to the other to avoid a cross conduction of both power MOSFETs.

##### USB Charge Current

When the USB port is selected as the power source, the charge current enabled by the logic input at the USBON pin. When the USBON is driven to logic LOW, the charger is disabled. When the USBON is driven to logic HIGH, the charge current is fixed at a typical value of 380mA. Thus for the USB input, the USBON pin has a similar function as the EN pin. The following table describes the USB charge control by both the USBON pin and EN pin. The USBON pin is equivalent to a logic LOW when left floating. Typically the P-channel MOSFET for the USB input has an  $r_{DS(ON)}$  of 700m $\Omega$  at room temperature. With a 380mA charge current, the typical head room is 260mV. Thus, if the input voltage drops to a level that the voltage difference between the USB pin and the BAT pin is less than 260mV, the  $r_{DS(ON)}$  becomes a limiting factor of the charge current; and the charger drops out the constant current regulation.



**Figure 3-15. BLOCKDIAGRAM**

#### Cradle Charge Current

The cradle charge current is enabled by the EN pin only, the USBON pin has no control on the cradle charge current. The cradle charge current is programmed with the external resistor connected between the ICDL pin and the GND pin. The current can be calculated with one of the equations given in the ICDL pin description. Two equations are used for the cradle current calculation, each corresponds to a different range of currents. The typical  $r_{DS(ON)}$  of the P-channel MOSFET for the CRDL input is 600mΩ at room temperature. When the head room between the input and output voltages is small, the actual charge current, similar to the USB case, could be limited by the  $r_{DS(ON)}$ . On the other hand, if the head room between the input and output voltages is large, the charge current may be limited by the thermal foldback threshold.

#### Floating Charge Voltage

The floating voltage during the constant voltage phase is 4.2V. The floating voltage has an 1% accuracy over the ambient temperature range of -40°C to 70°C.

### 3. TECHNICAL BRIEF

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#### Trickle Charge Current

When the battery voltage is below the minimum battery voltage  $V_{MIN}$  given in the electrical specification, the charger operates in a trickle/preconditioning mode, where the charge current is typically 14% of the programmed charge current for the cradle input. If power comes from the USB input, the trickle mode current is approximately 53mA.

#### End-of-Charge Indication

The CHG pin internal open-drain MOSFET turns off when the charge current falls below the  $I_{MIN}$  threshold, which is programmable for the cradle input and fixed for the USB input. Once the end-of charge-current is reached, the CHG status will be latched. The latch can be reset at one of the following conditions:

1. The part is disabled and re-enabled
2. The selected input source has been removed and reapplied
3. The USBON turns LOW and turns back to HIGH for the USB input
4. The BAT pin voltage falls below the CV mode threshold. Regardless of the CHG pin status, however, the charger does not turn off as long as an input power source is attached.

#### Power Presence Indication

When either the USB or the cradle input voltage is above the POR threshold, the PPR pin internal open-drain MOSFET turns on indicating the presence of input power.

#### Power-Good Range

Even if there is a power present, the charger will not deliver any current to the output if the powergood conditions are not met. The following two conditions together define the power-good voltage range:

1.  $V_{CDRL}$  or  $V_{USB} > V_{POR}$
2.  $V_{CDRL}$  or  $V_{USB} - V_{BAT} > V_{OS}$

where the  $V_{OS}$  is the offset voltage for the input and output voltage comparator, discussed shortly.

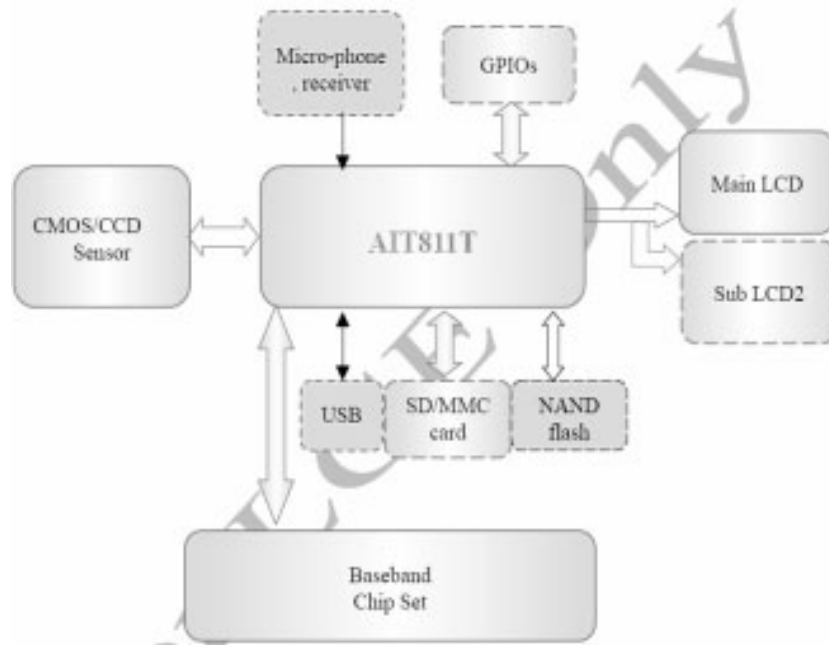
Both  $V_{POR}$ ,  $V_{OS}$  have hysteresis, as given in the Electrical Specification table.

The charger will not charge the battery if the input voltage does not meet the power-good conditions.

#### Thermal Foldback (Thermaguard™)

The thermal foldback function reduces the charge current when the internal temperature reaches the thermal foldback threshold, which is typically 100°C. This protects the charger from excessive thermal stress at high input voltages.

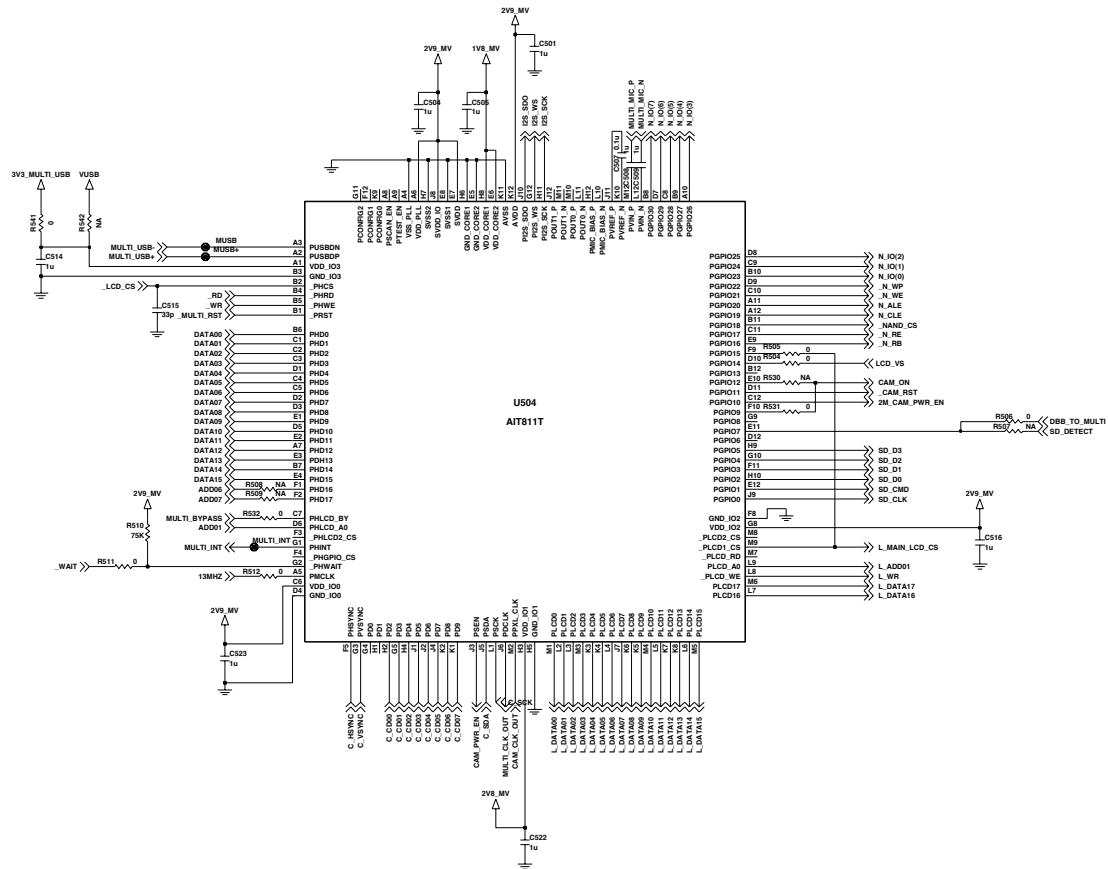
#### 3.7 CAMERA IC(AIT811,U504)



**Figure 3-15. AIT811 APPLICATION BLOCKDIAGRAM**

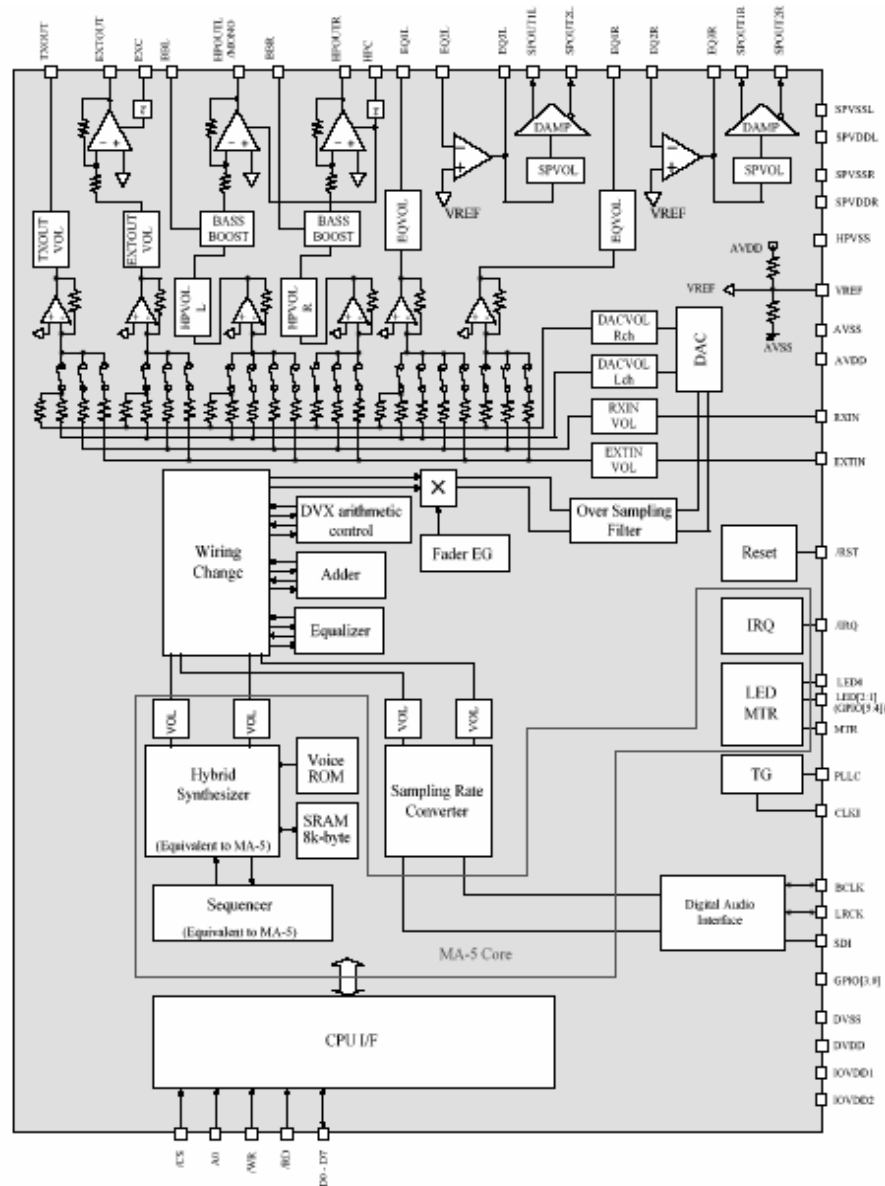


### 3. TECHNICAL BRIEF



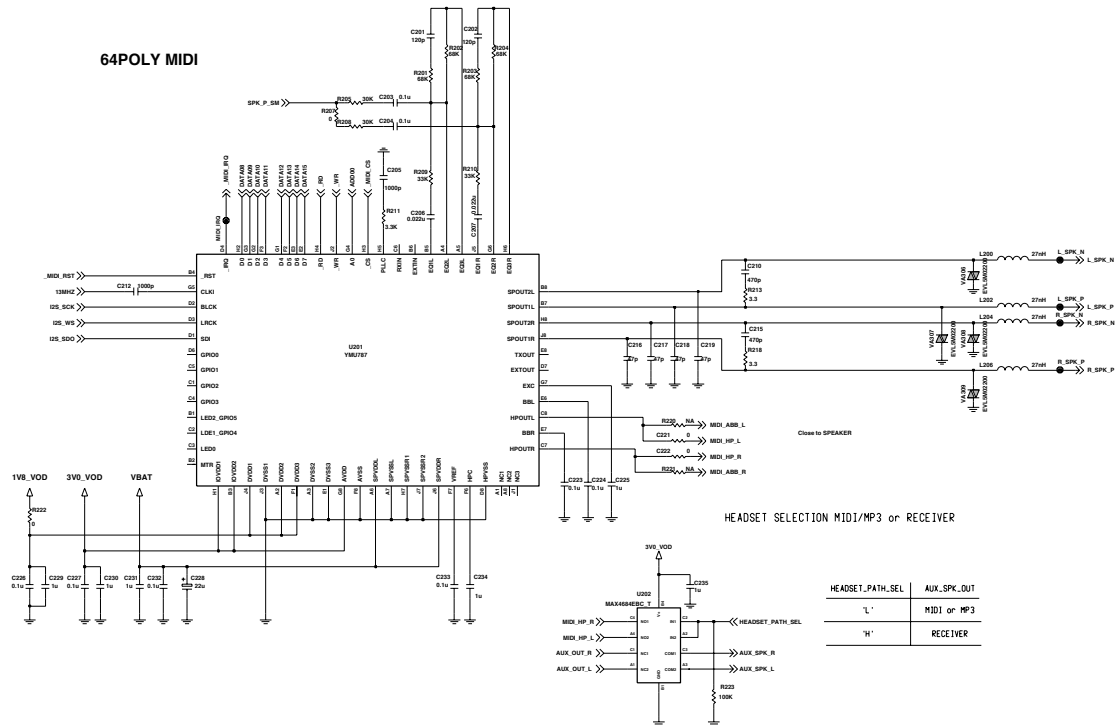
**Figure 3-24. AIT811 CIRCUIT**

#### 3.8 MIDI IC(YMU787,U201)



**Figure 3-24. YMU787 BLOCKDIAGRAM**

### 3. TECHNICAL BRIEF



**Figure 3-24. YMU787 CIRCUIT DIAGRAM**

#### CPU INTERFACE

CPU interface is an 8-bit parallel.

4 control signal(/wr,/rd,/cs,A0 pin), 8 data bit(D0 to D7), and 1 interrupt pin(/IRQ), totaling 13 pins are connected to the external CPU. This block controls the writing and reading of data by the input polarity of control signal

#### INTERFACE REGISTER

This register is able to access directly from the external CPU. There are 2 bytes spaces. The Intermediate register can be accessed through the interface register.

#### INTERMEDIATE REGISTER

This register is accessed through the Interface register.

It is composed to access a latter control register and ROM/SRAM through Intermediate register. This register is called "Intermediate register" since this exists in the middle of the interface register and the Control register. In the Intermediate register, there are some registers to control various functions.

#### **CONTROL REGISTER;ROM/SRAM**

The Control register and ROM/SRAM are accessed from “Instantaneous write register”, “Delayed write register”, and “Instantaneous read register” in the intermediate register.

In the control register, there is a register to control the following synthesizer mainly. The voice parameter for FM(GM 128 voices+DRUM 40 voices)and wave data for WT are stored in ROM. SRAM is used at the download of arbitrary FM voice parameter and Wave data for WT. moreover, it is used as storing buffer at the stream playback of PCM/ADPCM.

#### **FIFO**

This is an abbreviation of “First Input First Output” means the memory from which data is read in order of data written. There are 2 paths to write into FIFO in the Intermediate register. The “instantaneous write path” is for accessing the control register and ROM/SRAM immediately, also “Delayed write path” is for accessing the control register after managing time through the sequencer. FIFO size of Instantaneous path is 64 byte, and its size of Delayed path is 512-byte.

#### **SEQUENCER**

This is for interpreting the contents of data which is written into the “Delayed write path” Generally, “Music data” is written into the Delayed write path. It interprets the contents of music data and controls the synthesizer after sequencer, and then plays the music.

#### **Hybrid synthesizer**

This device contains a built in polyphonic synthesizer that adopts a stereophonic hybrid system that generate up to 64 tones. FM synthesizer, WT synthesizer, stream playback, HV synthesizer, and AL synthesizer are available.

#### **DIGITAL AUDIO INPUT INTERFACE**

This is a three wires type serial interface. The data length is 16bits.

#### **DPLL SECTION/SAMPLING RATE CONVERTER SECTION**

Sampling frequencies of signals from the digital audio interface section are changed into 48Khz.

#### **DIGITAL EQUALIZER SECTION**

This is a digital equalizer. Voice of signals from the Hybrid Synthesizer section and voice of digital audio signals are adjusted.

#### **DVX ARITHMETIC CONTROL**

Two-channel virtual speaker image function that is based on DVX technology makes it possible to create natural stereo sound under the two closely spaced speakers.

#### **OVER SAMPLING FILTER**

4 Times of over sampling filter. It converts a signal of sampling frequency 48Khz into a signal of 192Khz, and then send to DAC

#### **GENERAL PARALLEL I/O PORT SECTION(GPIO)**

There are six general parallel I/O ports. It is possible to read and write from the Intermediate register.

### 3. TECHNICAL BRIEF

---

#### **LED,VIBRATOR CONTROL**

It is possible to synchronize an LED and vibrator with a play, and to control. Asynchronous control With a play is also supported. It supports 3 color LED control and it is possible to display 7 colors In maximum.

#### **CLOCK GENERATING BLOCK**

This device supports a clock input ranging from 1.5Mhz to 27Mhz.

It is a block to generate a clock which is needed inside of LSI in the PLL.

#### **DAC**

It converts digital signals from a synthesizer and a digital audio section into analog signals.

Its resolution is 16bits.

#### **ANALOG LINE INPUT SECTION(EXTIN,RXIN)**

External audio signal and receiver audio signal are inputted.

There is a Volume to adjust the level in each.

#### **MIXER SECTION**

Selection of an input source(DAC output, RXIN, and EXTIN) against each analog output(SPOUT, HPOUT,EXTOUT,TXOUT) and mixing are performed.

#### **EQ AMPLIFIER SECTION**

The change of filter characteristic and gain is possible by adjusting the resistors and external parts.

#### **SPEAKER AMPLIFIER SECTION**

The two digital speakers amplifier, which has a maximum output power of 500mW at SPVDDL/R=3.6V and RL=8ohm, is integrated in this device. There is a volume to adjust output level in the first stage of amplifier.

#### **HEADPHONE AMPLIFIER SECTION(HPOUT)**

This is an amplifier for stereophonic headphone(RL=16ohm)output.

When it is used as a monaural output, Rch becomes power-down.

In the previous part of it, there are a volume and a bass-boost circuit.

#### **EXTERNAL OUTPUT AMPLIFIER SECTION(EXTOUT)**

This is an amplifier for external output(RL=600ohm)

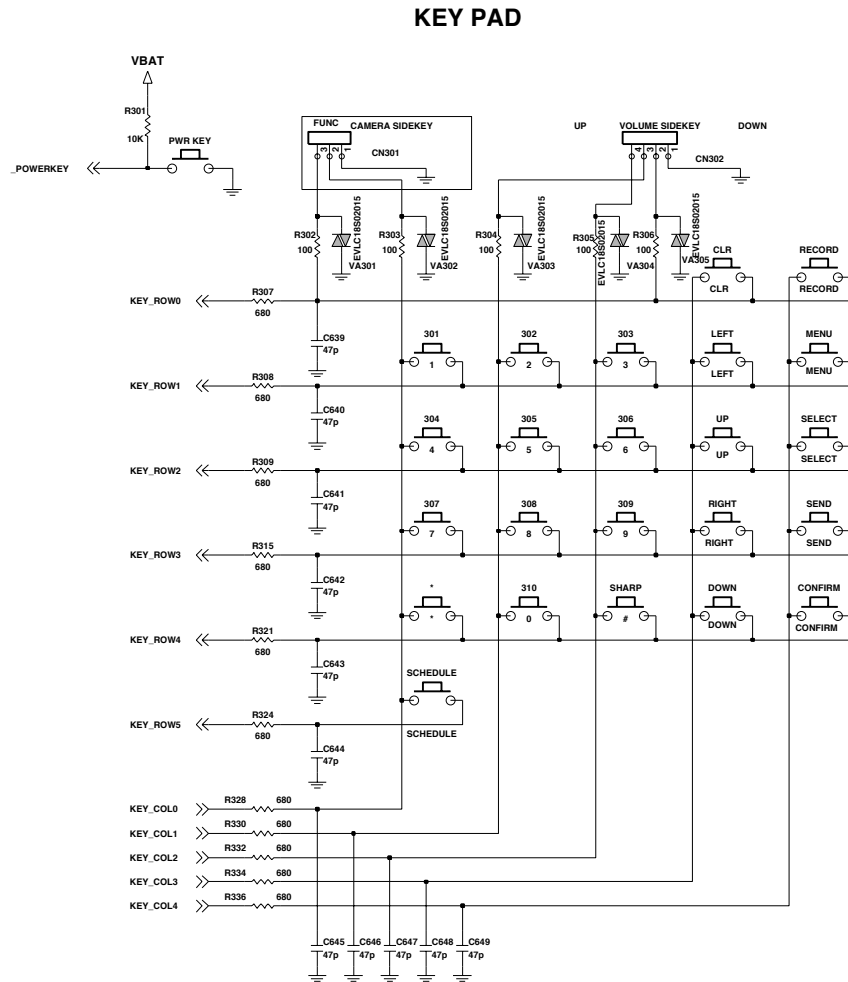
In the previous part of it, there is a volume to adjust the output level

#### **ANALOG LINE OUTPUT SECTION(TXOUT)**

This is monaural line output(RL=10kohm)

There is a volume to adjust the output level.

### 3.9 Keypad Switches and Scanning



**Figure 3-27. Keypad Switches and Scanning**

## 3. TECHNICAL BRIEF

### 3.10 Microphone

The vibrator is placed in the folder cover and contacted to LCD MODULE. The vibrator is driven from VIBRATOR (GPIO\_3) of AD6527.

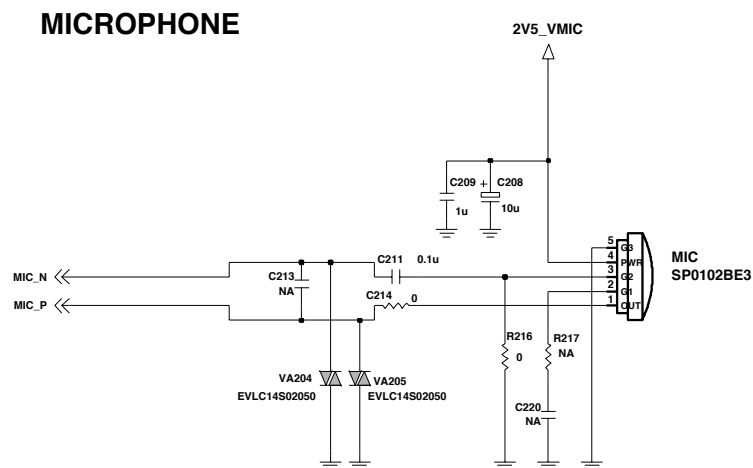
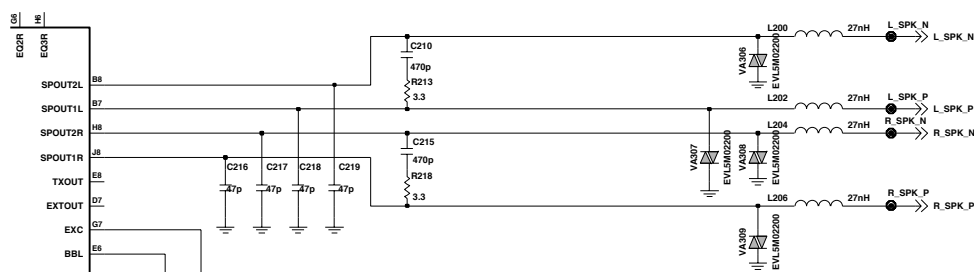
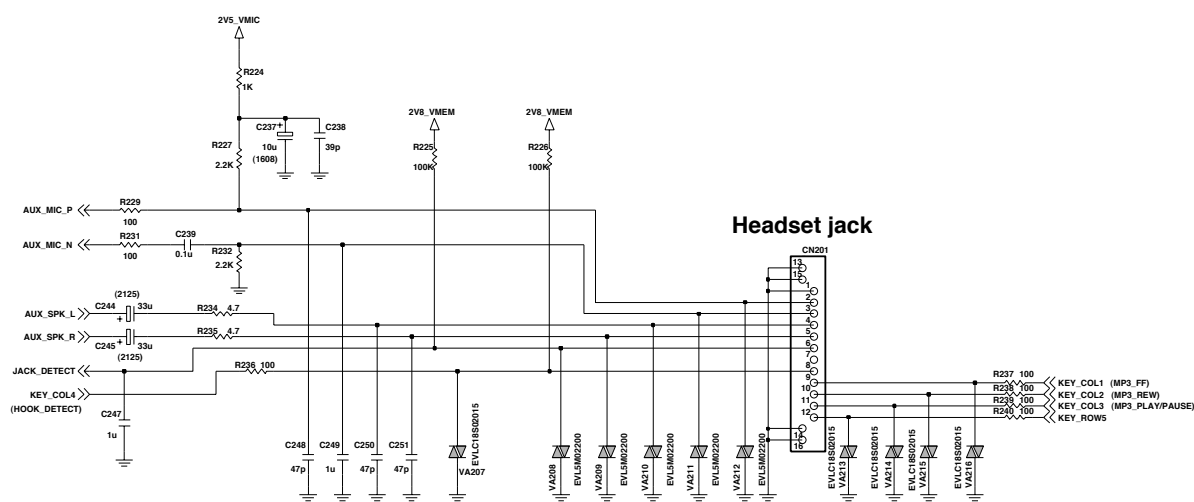


Figure 3-28. Connection between Microphone and AD6535

### 3.11 Main Speaker



### 3.12 Headset Interface



**Figure 3-29. HEADSET JACK INTERFACE**



### 3. TECHNICAL BRIEF

#### 3.13 EL DRIVER IC (D381B,U700)

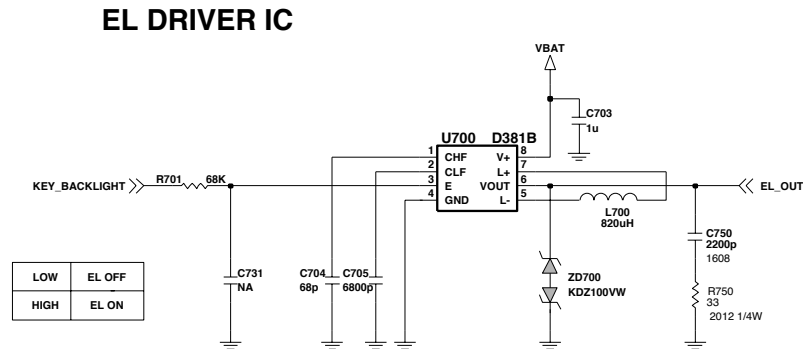


Figure 3-30. OLED

#### MEMORY(INTEL,U204)

##### Memory(INTEL, 256Mbit FLASH/64Mbit pSRAM)

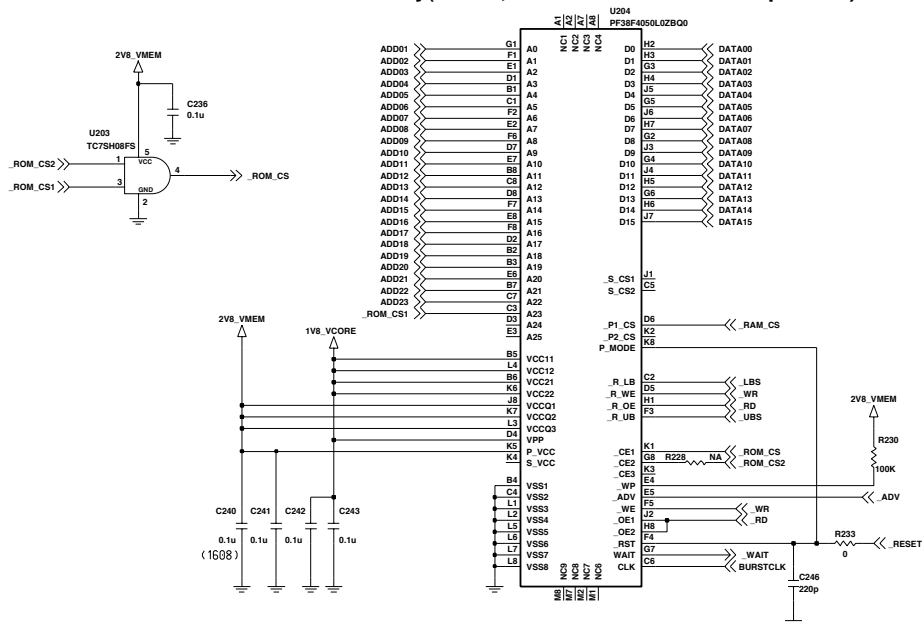


Figure 3-30. MEMORY

## BLUETOOTH(LBMA-2C67B2,M301)

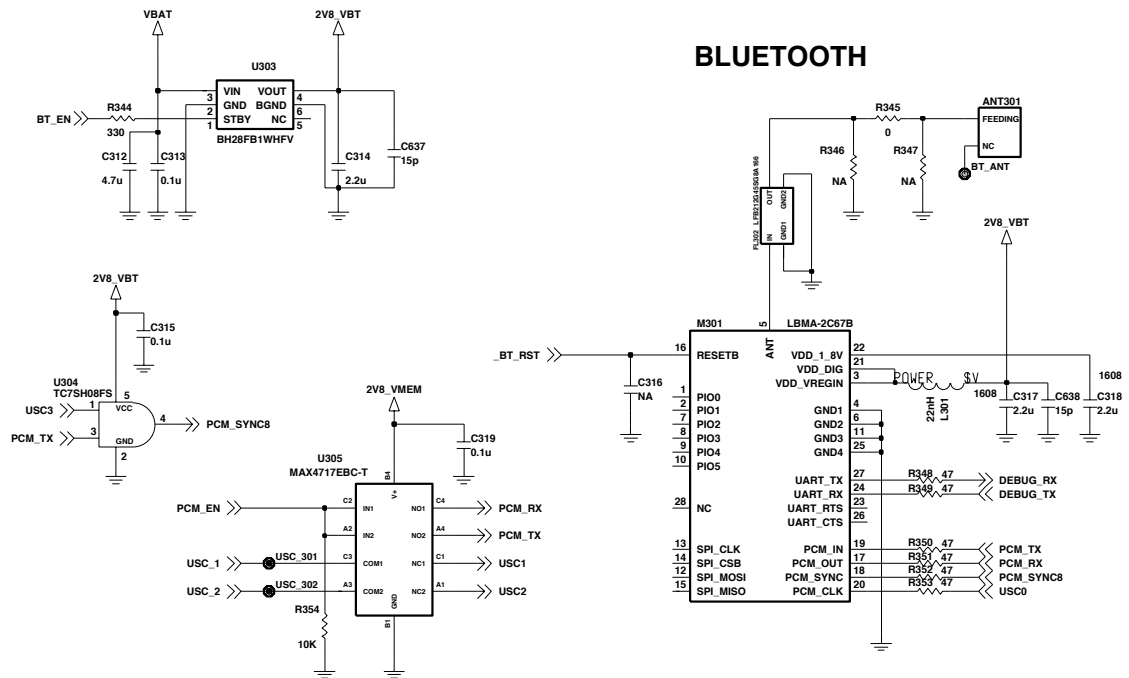


Figure 3-30. BT MODULE

### 3. TECHNICAL BRIEF

## CAMERA CONNECTOR, CAMERA LDO(U401,U403)

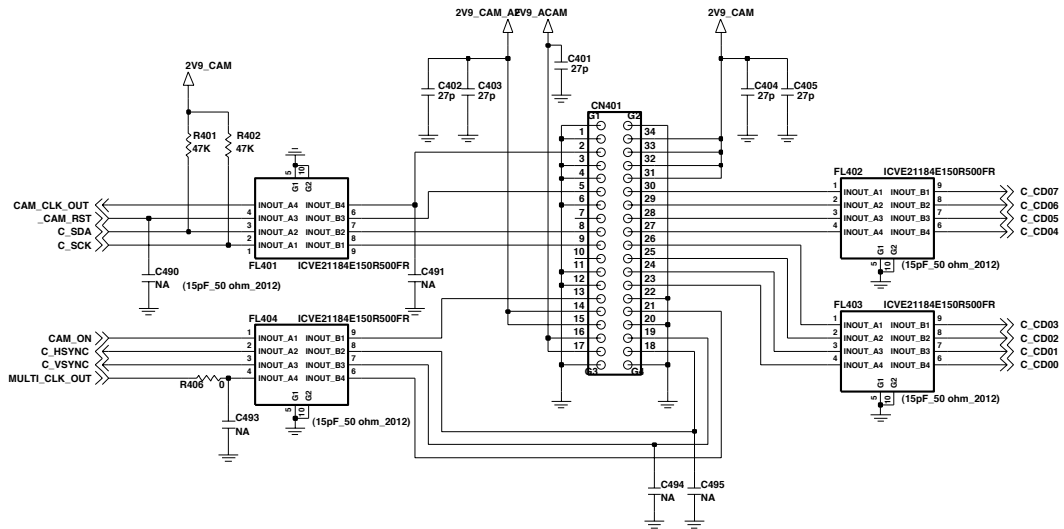


Figure 3-30. CAMERA CONNECTOR

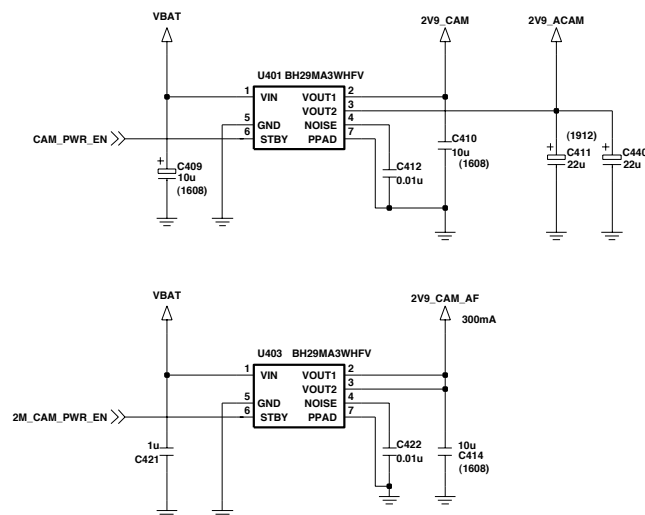
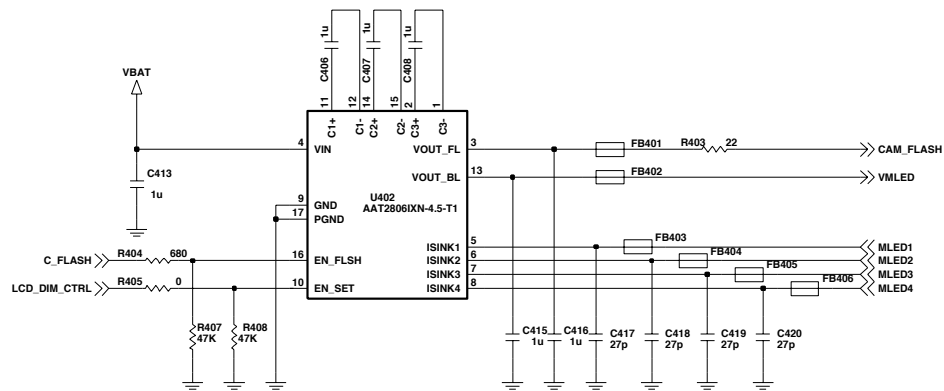


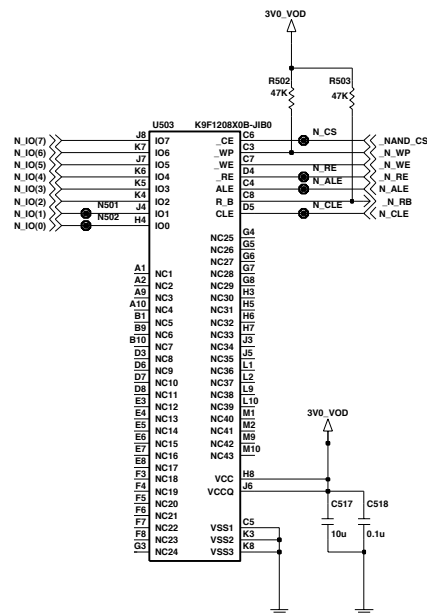
Figure 3-30. CAMERA CONNECTOR

## LCD BACKLIGHT, FLASH LED CHARGE PUMP (AAT2806IXN-4.5-T1,U402)

### LCD BACKLIGHT LED/FLASH LED CHARGE PUMP

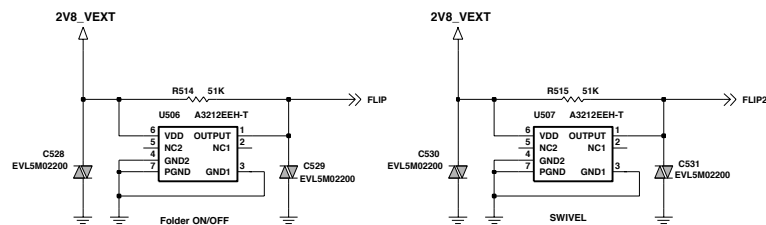


**Figure 3-30. CHAGE PUMP**



**Figure 3-30. NAND MEMORY**

## FLIP SWITCH



**Figure 3-30. FLIP SWITCH**

T-FLASH CARD, LDO (S700,U102)

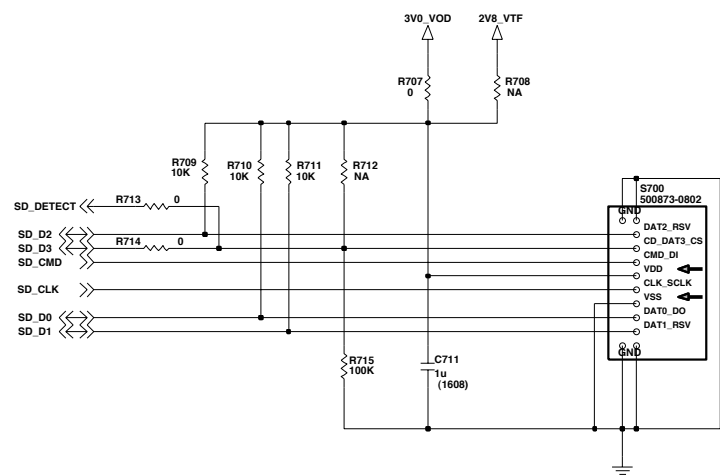


Figure 3-30. T-FLASH CARD

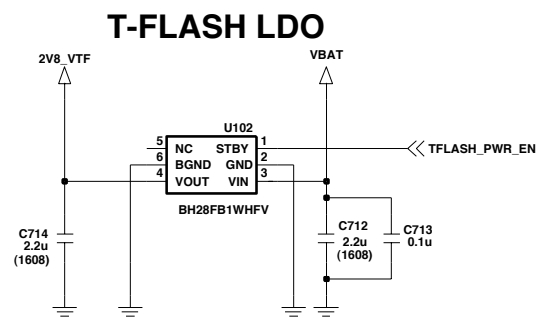


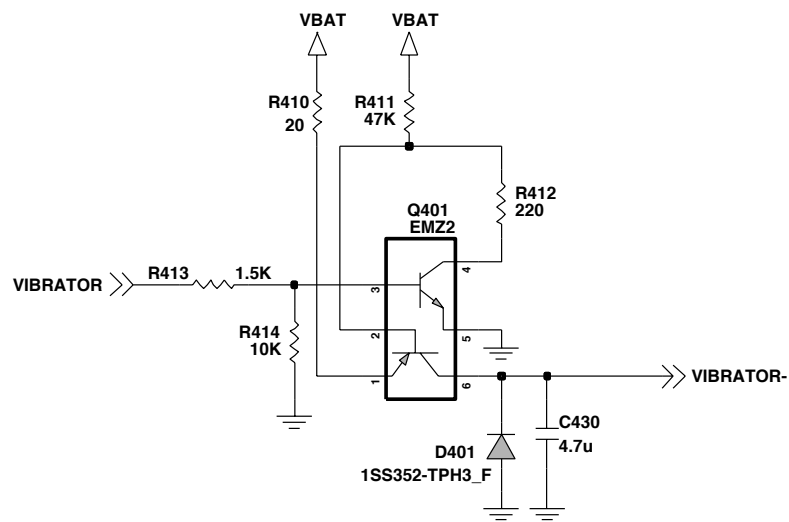
Figure 3-30. T-FLASH CARD

### 3. TECHNICAL BRIEF

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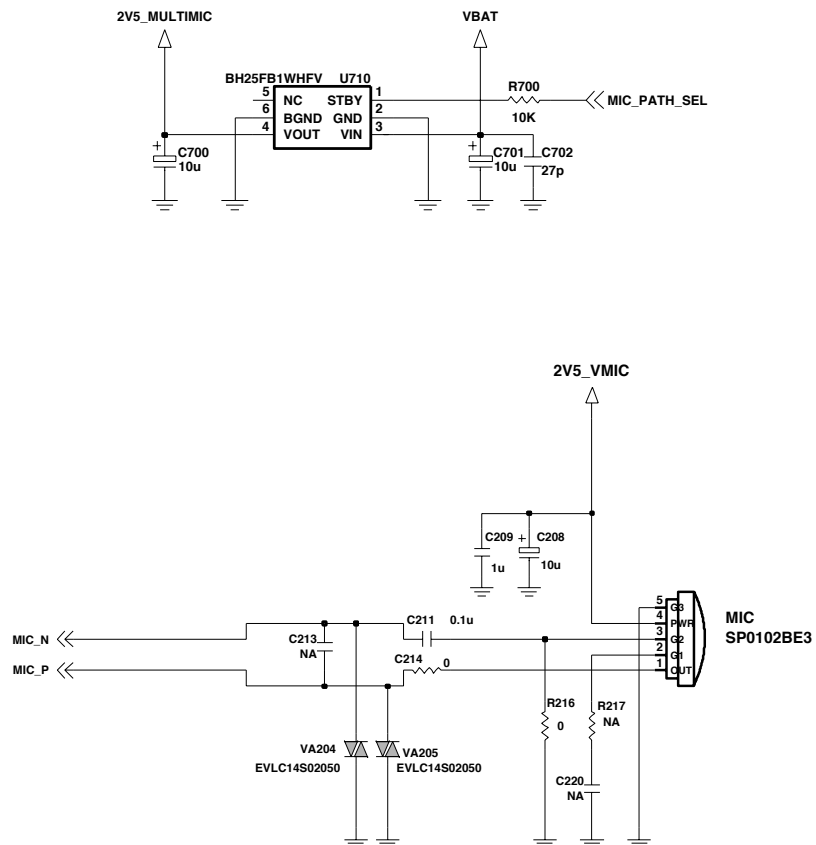
#### 3.14 VIBRATOR

The vibrator is placed in the folder cover and contacted to LCD MODULE. The vibrator is driven from VIBRATOR from AD6527B.



**Figure 3-32. MOTOR**

#### MULTIMEDIA MIC(OSF213,MIC700)



**Figure 3-32. MULTIMEDIA MIC**



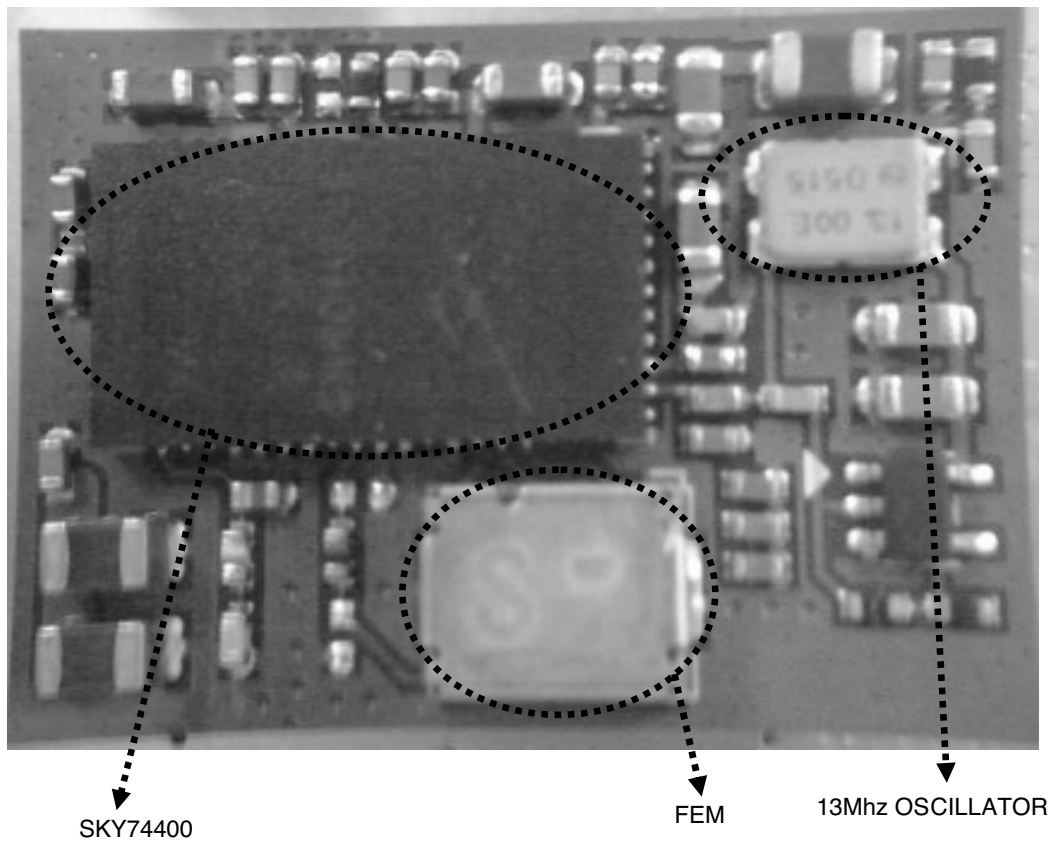
## 4. TROUBLE SHOOTING

---

## 4. TROUBLE SHOOTING

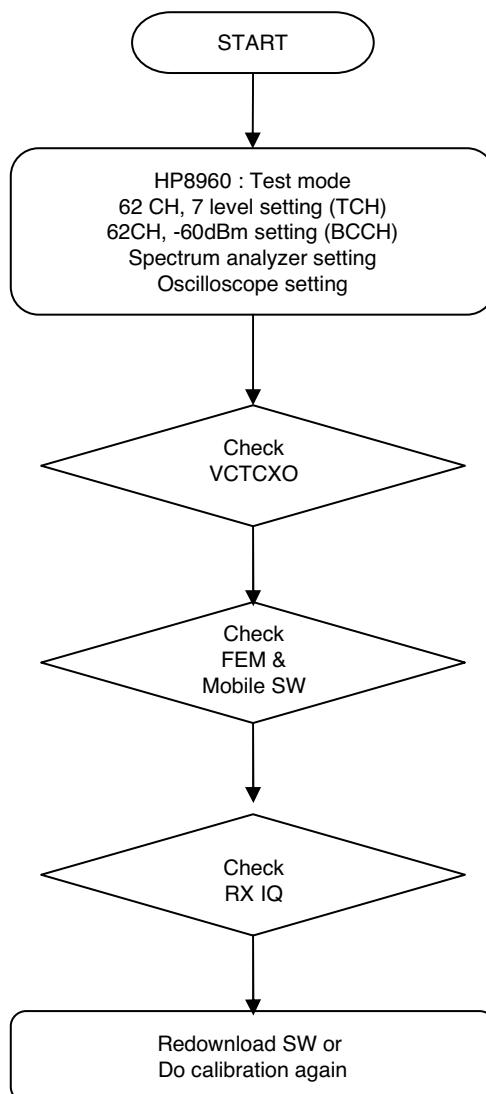
### 4.1 RX Trouble

TEST POINT



**Figure 4-1(a)**

### Checking Flow

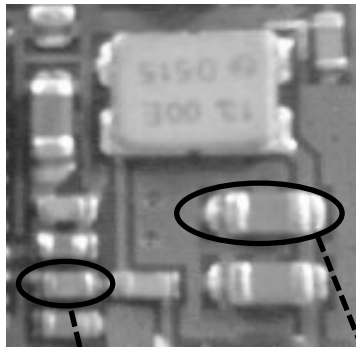


## 4. TROUBLE SHOOTING

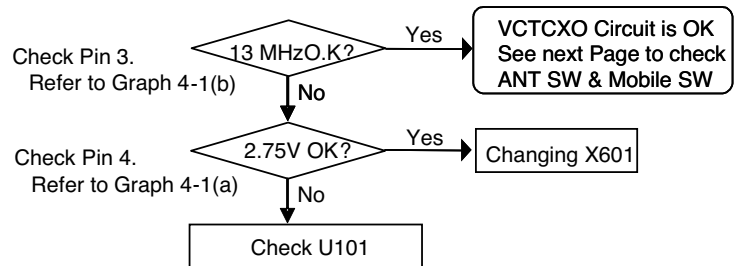
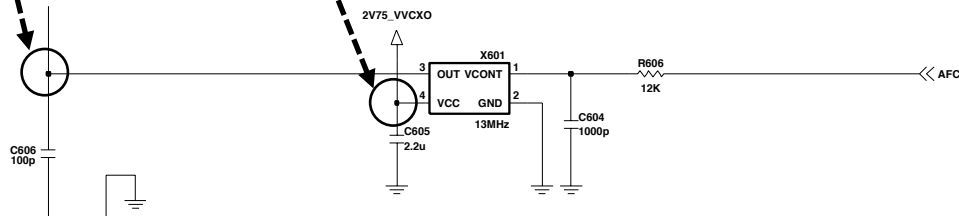
### (1) Checking VCTCXO Circuit

#### TEST POINT

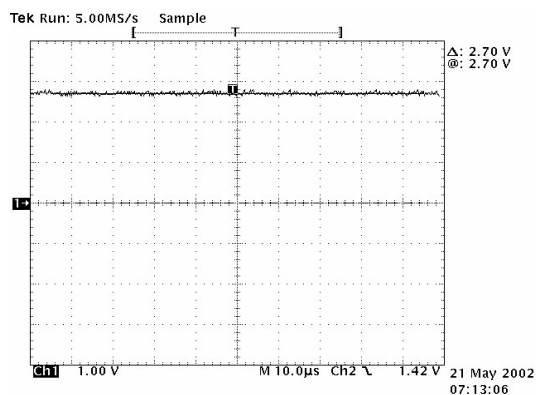
#### Checking Flow



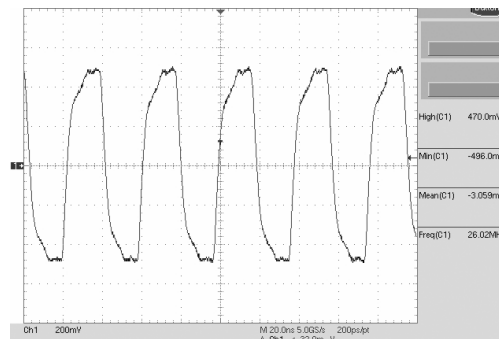
#### CIRCUIT



#### Waveform



Graph 4-1(a)



Graph 4-1(b)

## 4. TROUBLE SHOOTING

### (2) Checking FEM & Mobile SW

#### TEST POINT

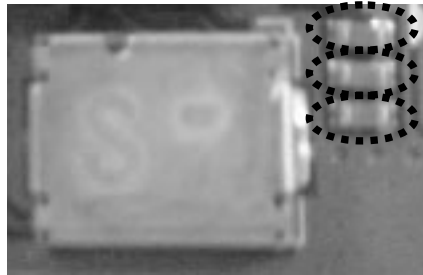
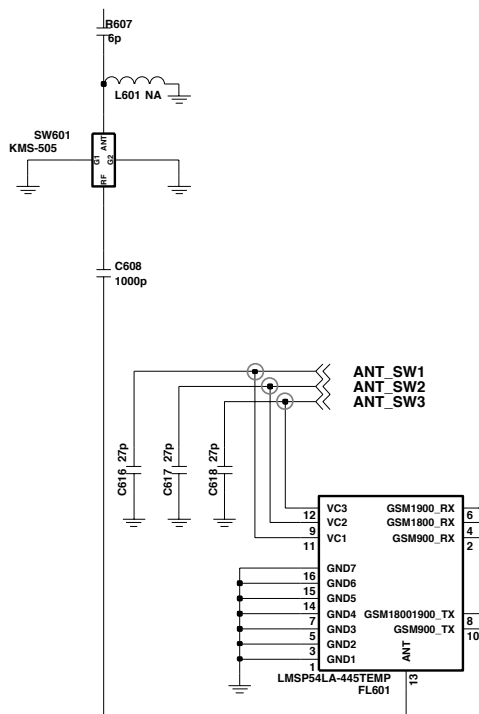
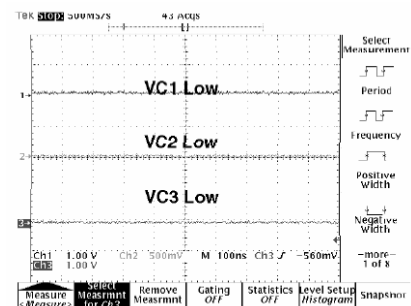


Figure 4-5

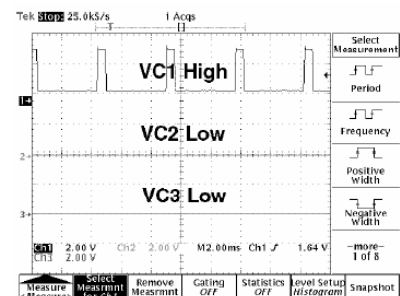
#### CIRCUIT



#### Waveform



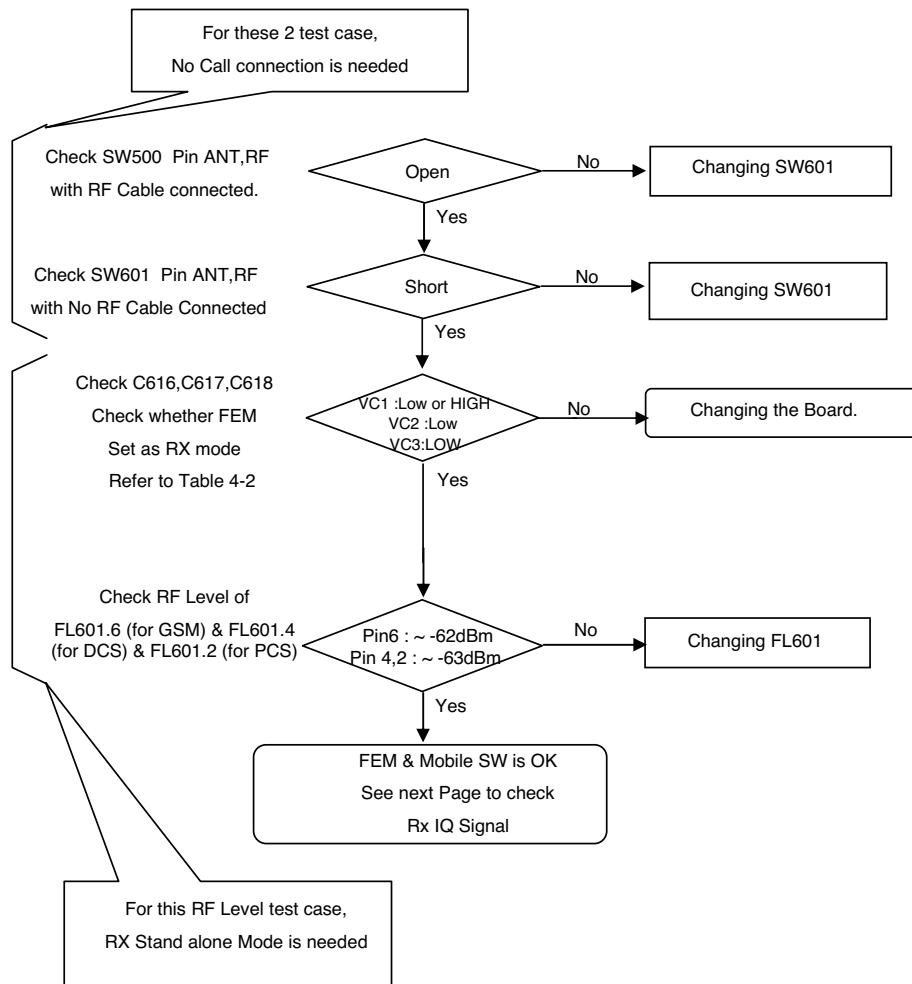
FEM Control GSM& DCS  
Graph 4-3(a)



FEM Control PCS  
Graph 4-3(b)

## 4. TROUBLE SHOOTING

### Checking Flow



	Vc1	Vc2	Vc3	Current
EGSM-Tx	0.0-0.1V	0.0-0.1V	2.3-3.0V	10mA Max
EGSM-Rx	0.0-0.1V	0.0-0.1V	0.0-0.1V	≈ 0mA
DCS/PCS-Tx	0.0-0.1V	2.3-3.0V	0.0-0.1V	10mA Max
DCS-Rx	0.0-0.1V	0.0-0.1V	0.0-0.1V	≈ 0mA
PCS-Rx	2.3-3.0V	0.0-0.1V	0.0-0.1V	10mA Max

**Table 4-2**

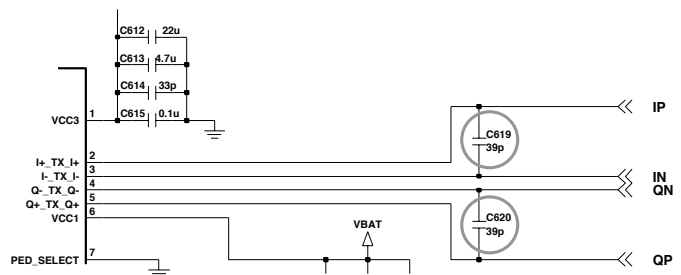
## 4. TROUBLE SHOOTING

### (4) Checking RX IQ

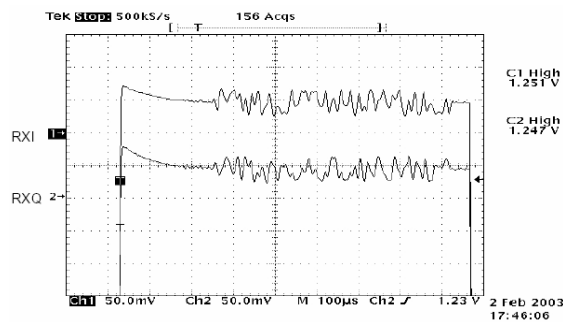
#### TEST POINT



#### CIRCUIT

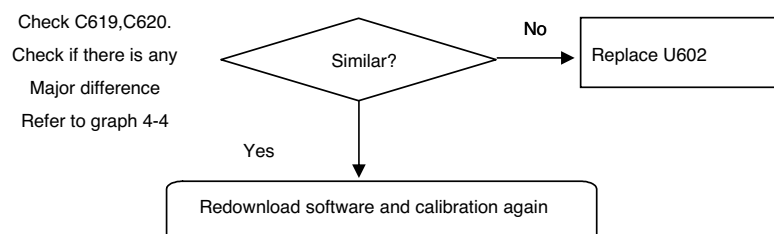


#### Waveform



Graph 4-4

#### Checking Flow

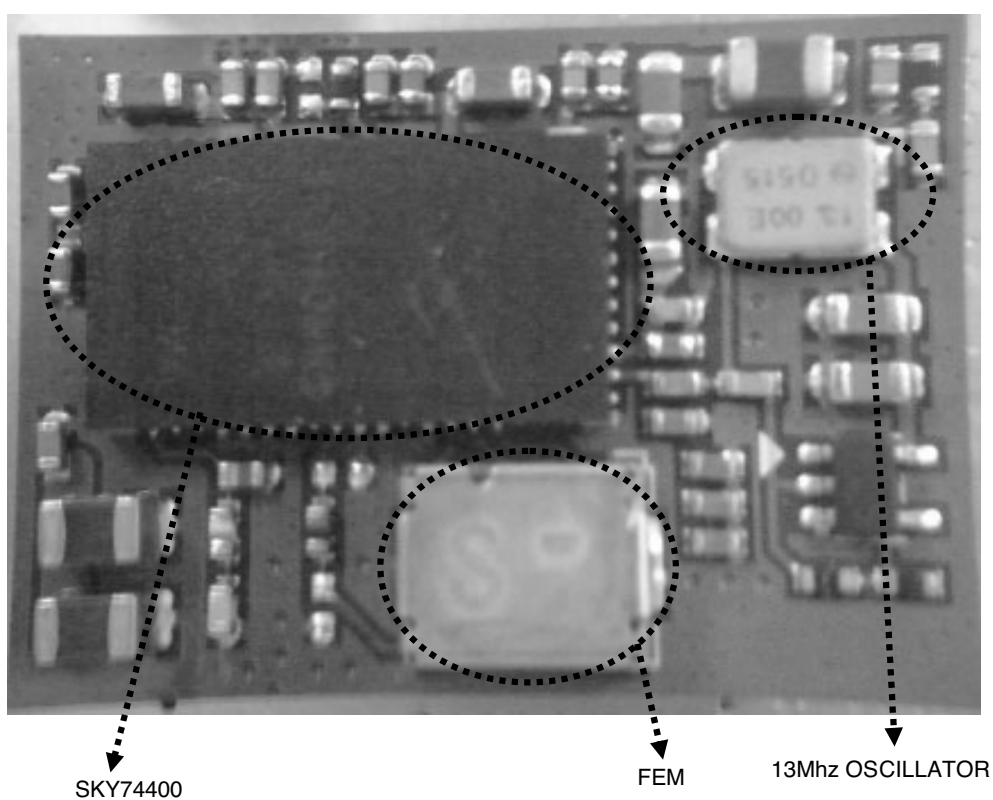


## 4. TROUBLE SHOOTING

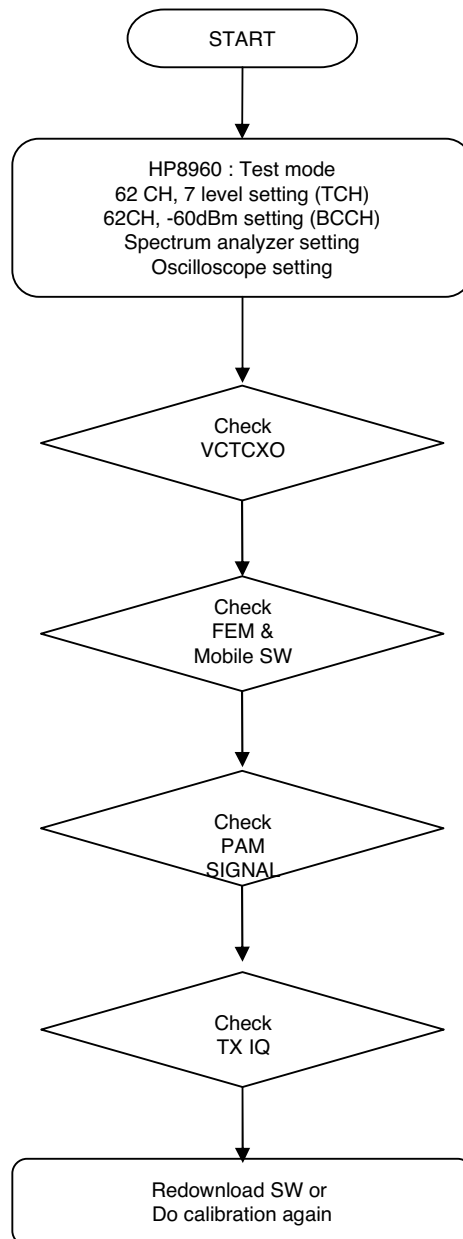
---

### 4.2 TX Trouble

#### TEST POINT



### Checking Flow



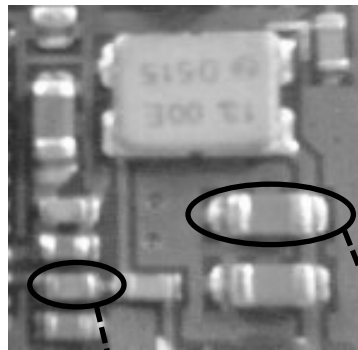


## 4. TROUBLE SHOOTING

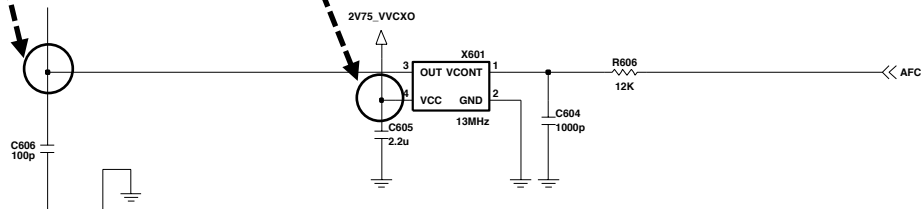
### (1) Checking VCTCXO Circuit

#### TEST POINT

#### Checking Flow



#### CIRCUIT



Check Pin 3.  
Refer to Graph 4-1(b)

13 MHz O.K.?

Yes

VCTCXO Circuit is OK  
See next Page to check  
ANT SW & Mobile SW

No

Check Pin 4.  
Refer to Graph 4-1(a)

2.75V OK?

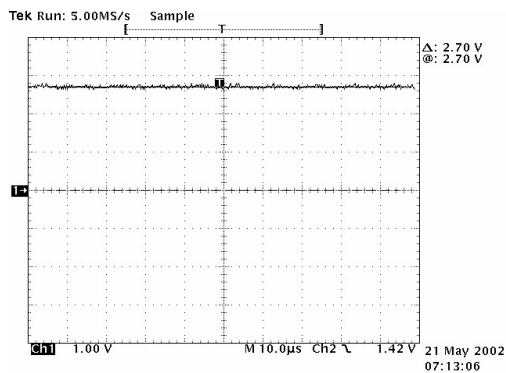
Yes

Changing X601

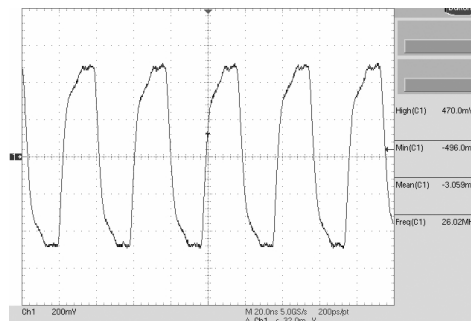
No

Check U101

#### Waveform



Graph 4-1(a)



Graph 4-1(b)

## 4. TROUBLE SHOOTING

### (2) Checking Ant SW & Mobile SW

#### TEST POINT

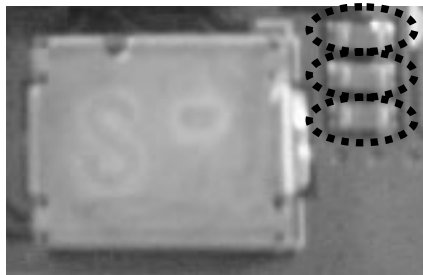
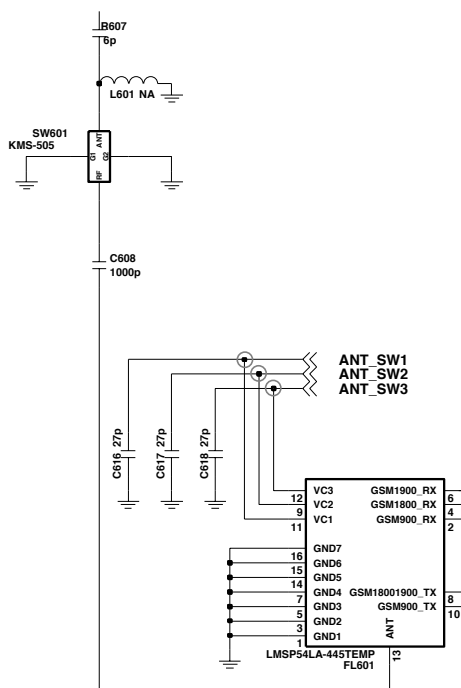


Figure 4-5

#### CIRCUIT



#### Waveform



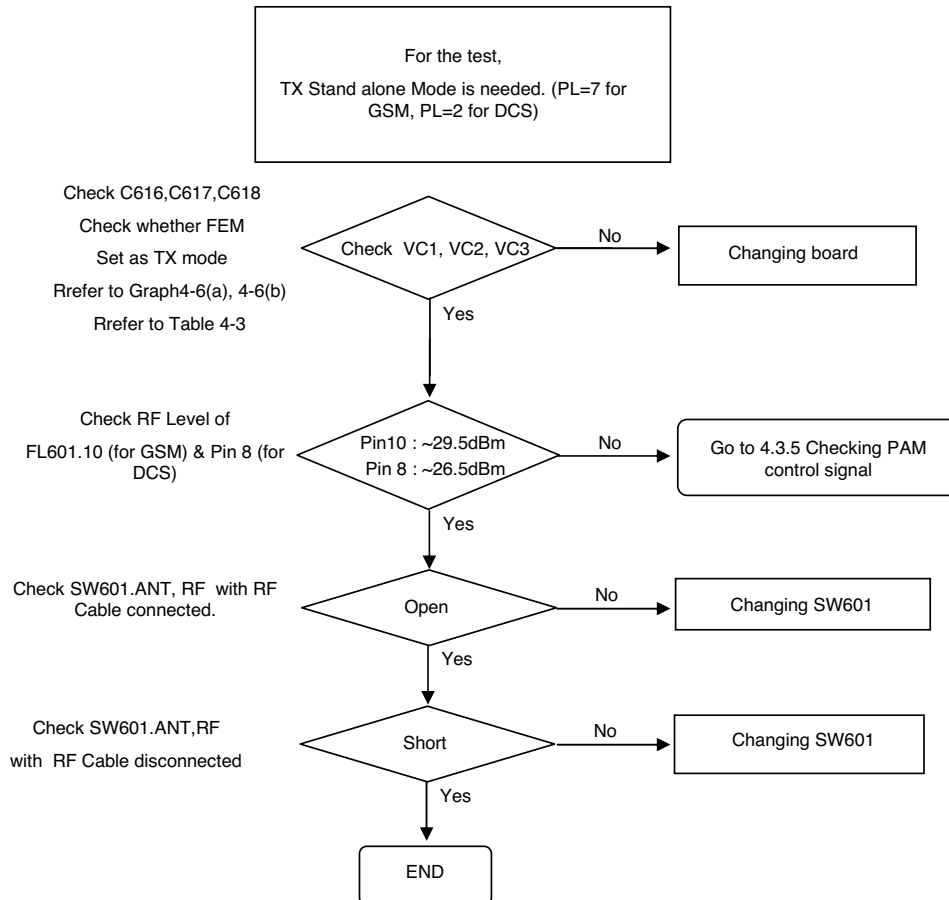
FEM Control EGSM  
Graph 4-6(a)



FEM Control DCS & PCS  
Graph 4-6(b)

## 4. TROUBLE SHOOTING

### Checking Flow



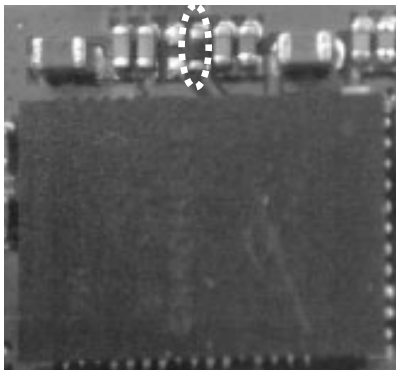
	Vc1	Vc2	Vc3	Current
EGSM-Tx	0.0-0.1V	0.0-0.1V	2.3-3.0V	10mA Max
EGSM-Rx	0.0-0.1V	0.0-0.1V	0.0-0.1V	≈ 0mA
DCS/PCS-Tx	0.0-0.1V	2.3-3.0V	0.0-0.1V	10mA Max
DCS-Rx	0.0-0.1V	0.0-0.1V	0.0-0.1V	≈ 0mA
PCS-Rx	2.3-3.0V	0.0-0.1V	0.0-0.1V	10mA Max

**Table 4-2**

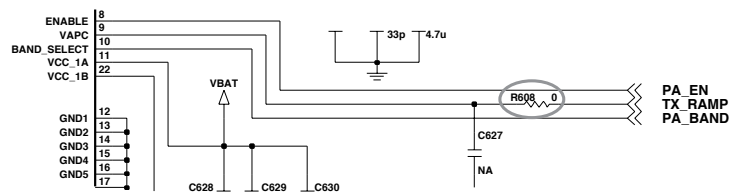
## 4. TROUBLE SHOOTING

### (4) Checking PAM Control Signal

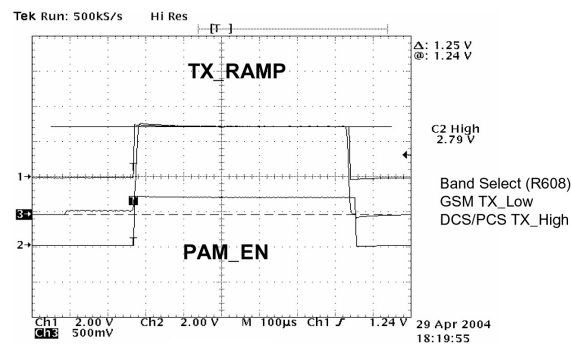
#### TEST POINT



#### CIRCUIT



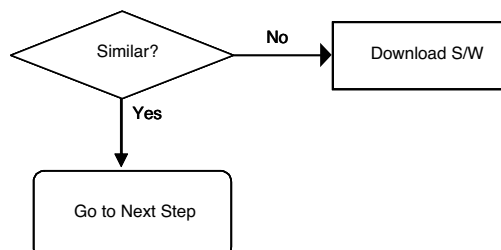
#### Waveform



Graph 4-7

#### Checking Flow

Check TX\_RAMP and PA\_EN  
Check if there is  
Any Major Difference or not  
Refer to Graph 4 - 7



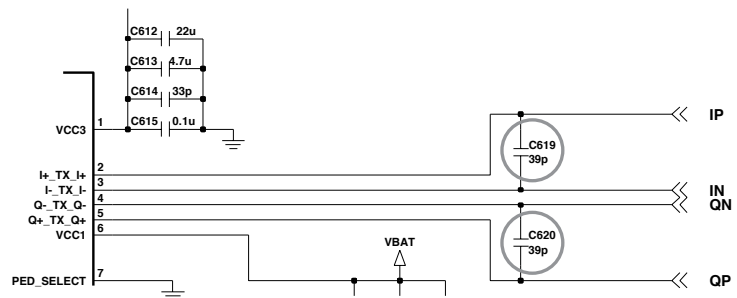
## 4. TROUBLE SHOOTING

### (5) Checking TX IQ

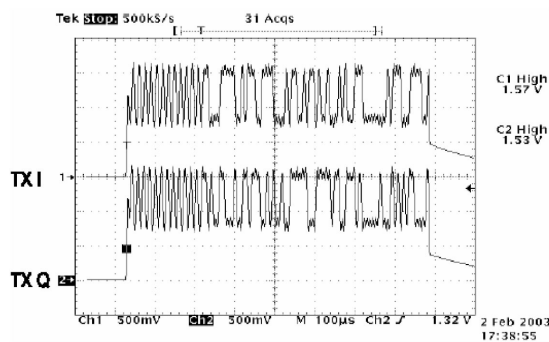
#### TEST POINT



#### CIRCUIT

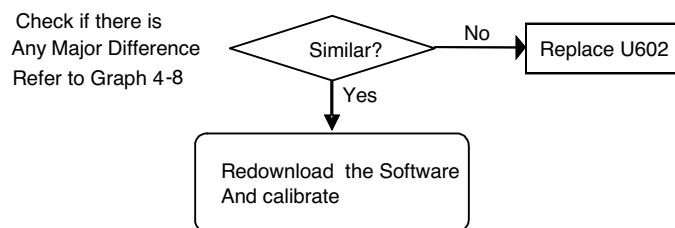


#### Waveform



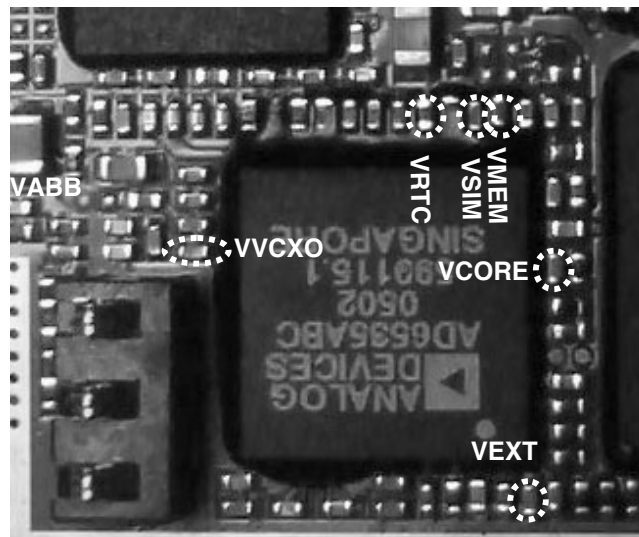
Graph 4-8

#### Checking Flow

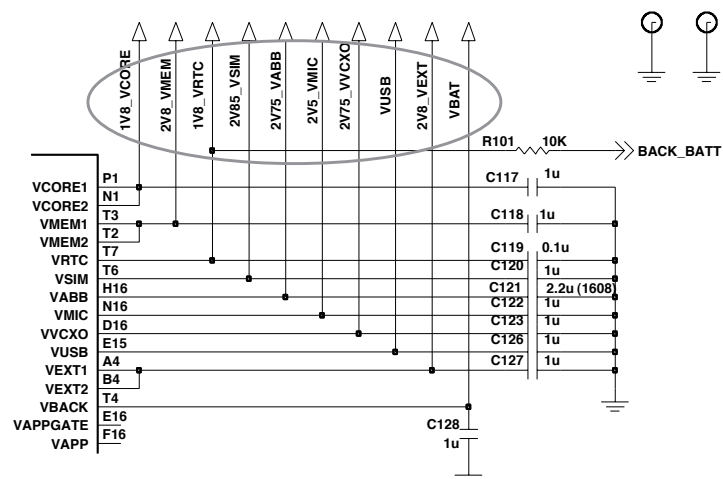


### TEST POINT

### TEST POINT

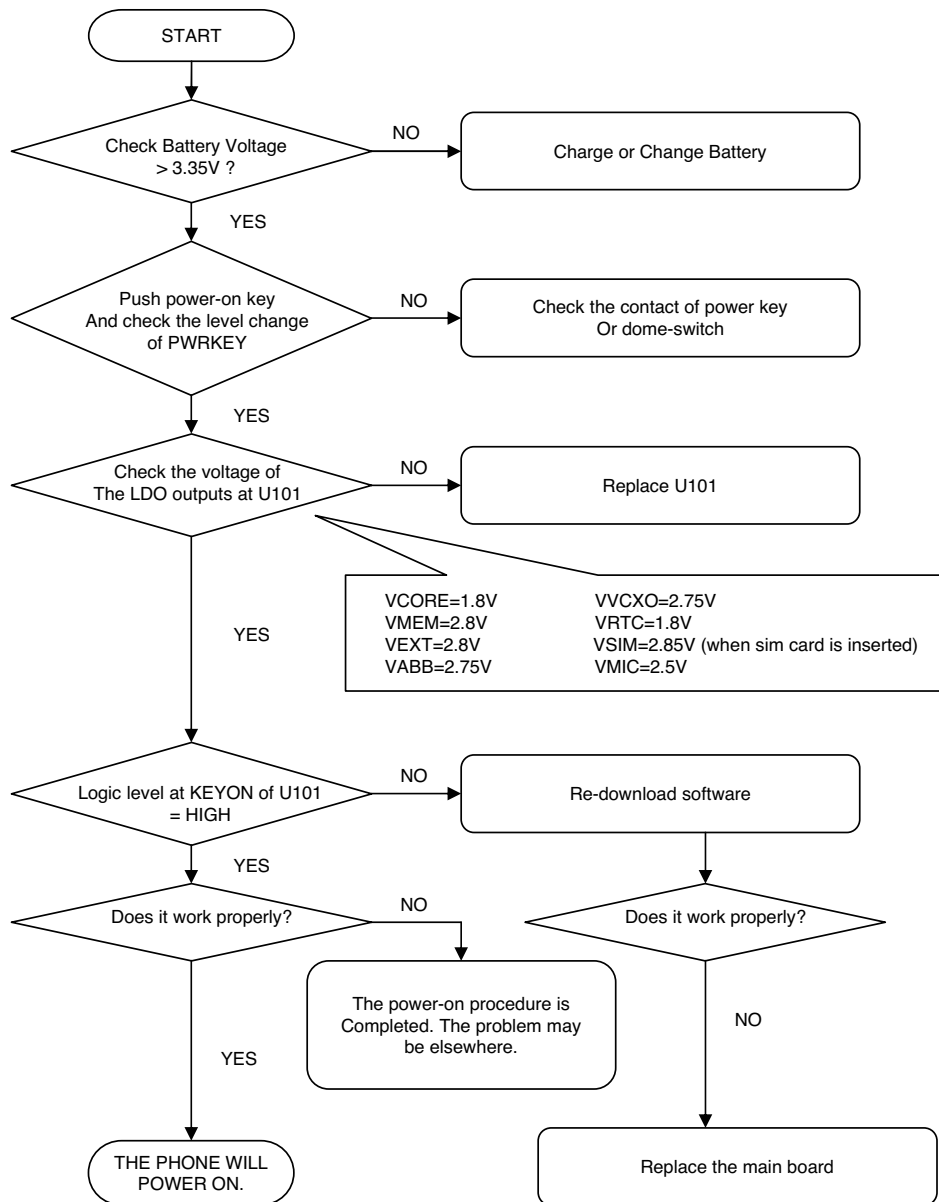


## CIRCUIT



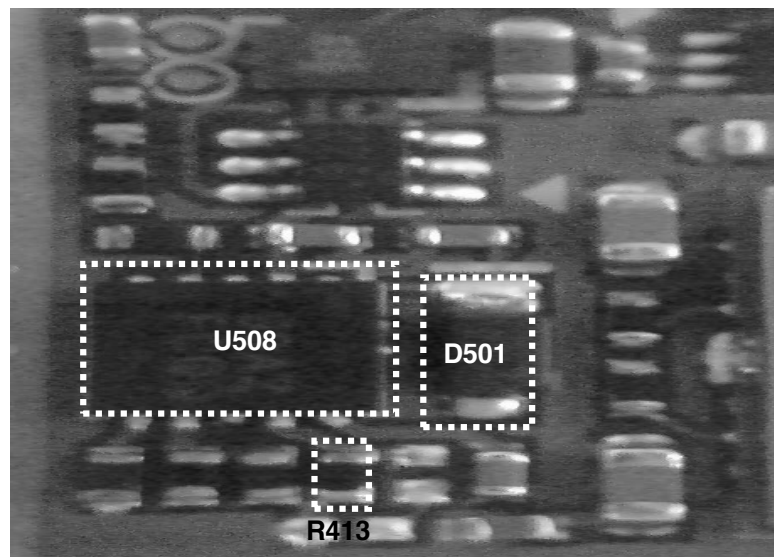
## 4. TROUBLE SHOOTING

### Checking Flow



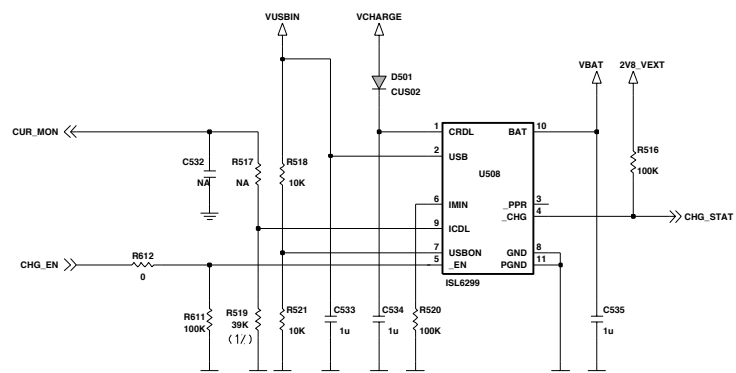
### 4.4 Charging Trouble

#### TEST POINT



#### CIRCUIT

##### Charging IC

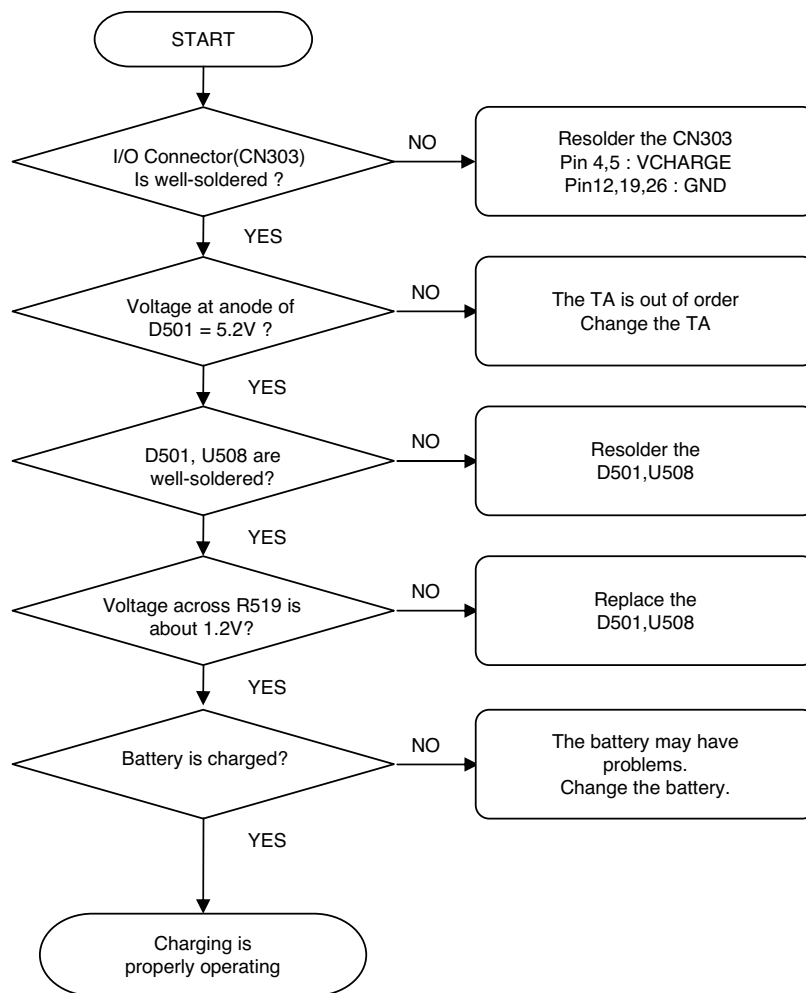




## 4. TROUBLE SHOOTING

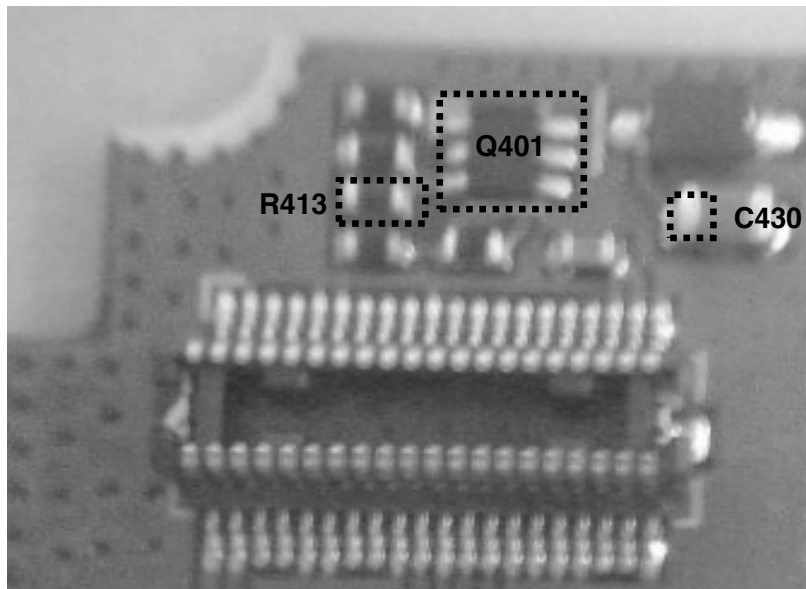
---

### Checking Flow

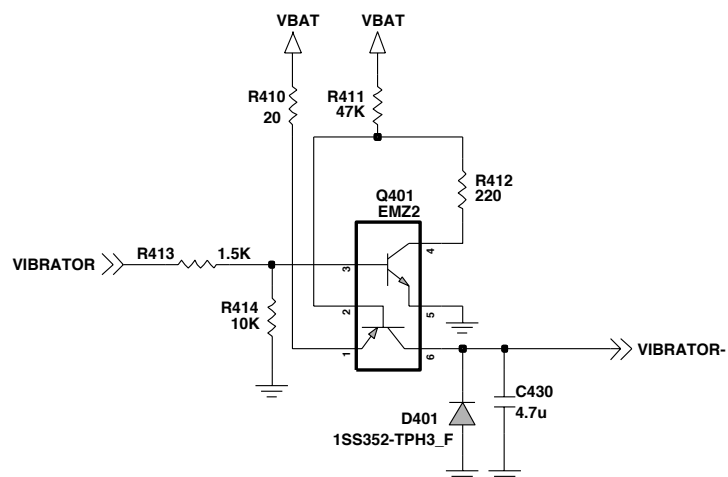


### 4.5 Vibrator Trouble

#### TEST POINT



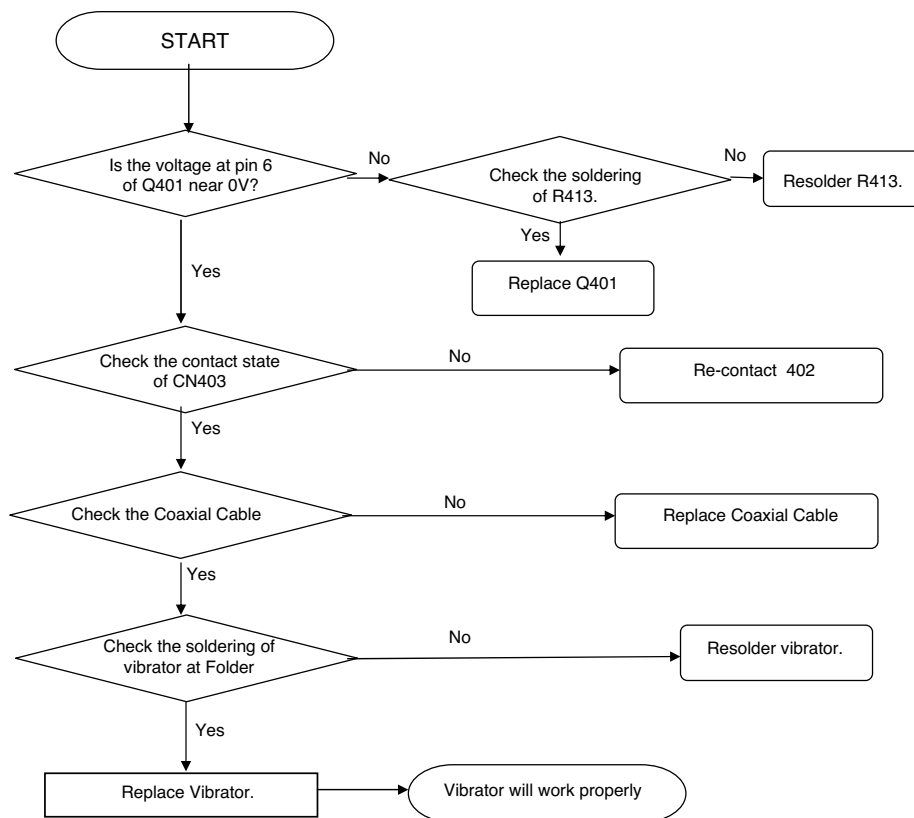
#### CIRCUIT



## 4. TROUBLE SHOOTING

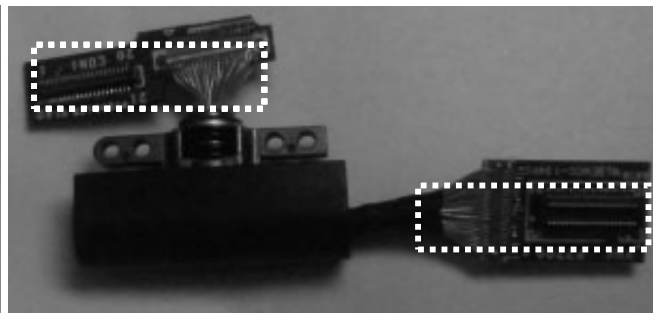
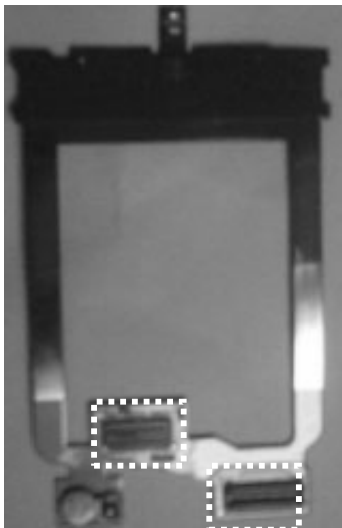
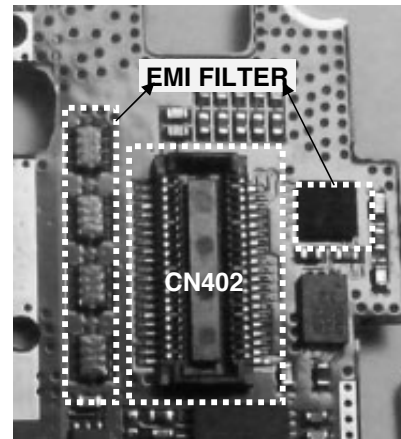
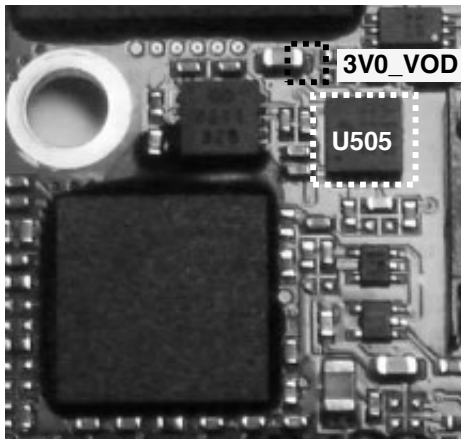
### Checking Flow

SETTING : Enter the engineering mode, and set vibrator on at vibration of BB test menu



### 4.6 LCD Trouble

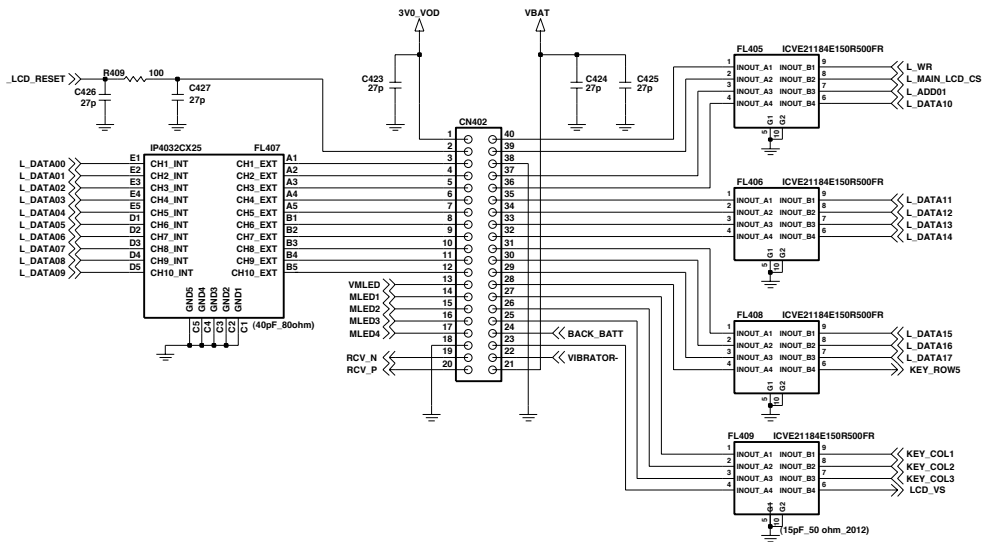
#### TEST POINT



<Coaxial Cable>

## CIRCUIT DIAGRAM

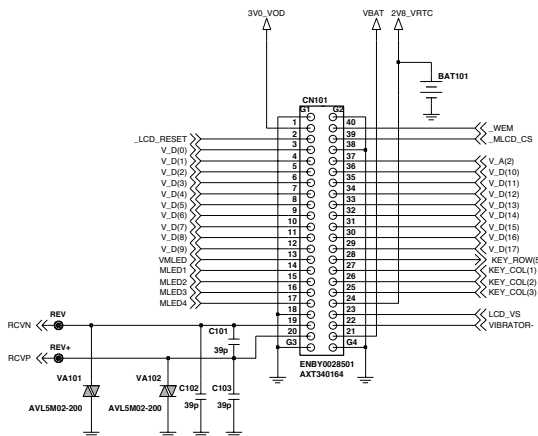
## - Main PCB



**- LCD FPCB**

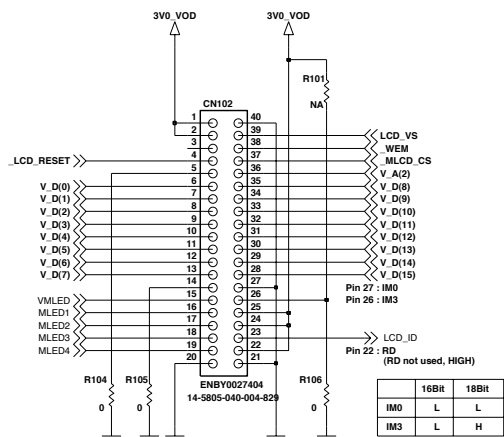
## FOLDER CONNECTOR

(MATSUSHITA, P4S,Female,40PIN,1.5T)

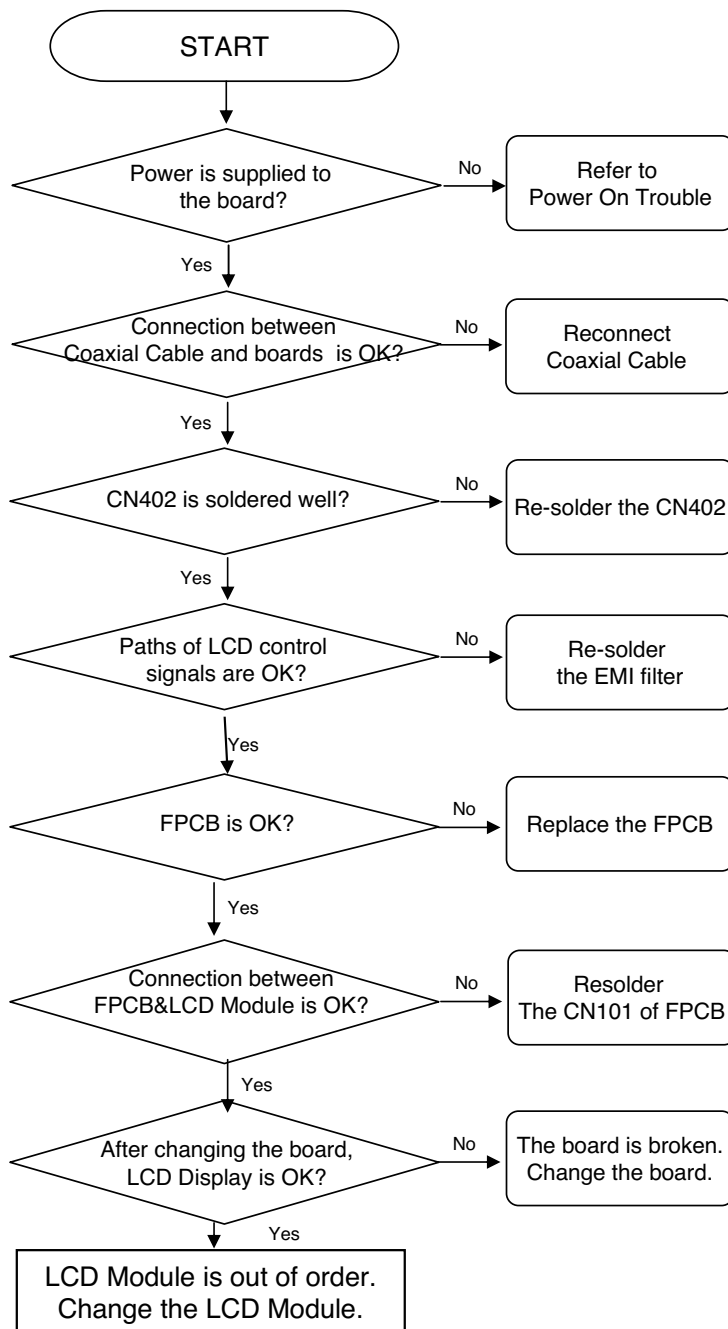


**TO LCD CONNECTOR**

(ELCO, Male, 40PIN, 1.0T, Dual contact)



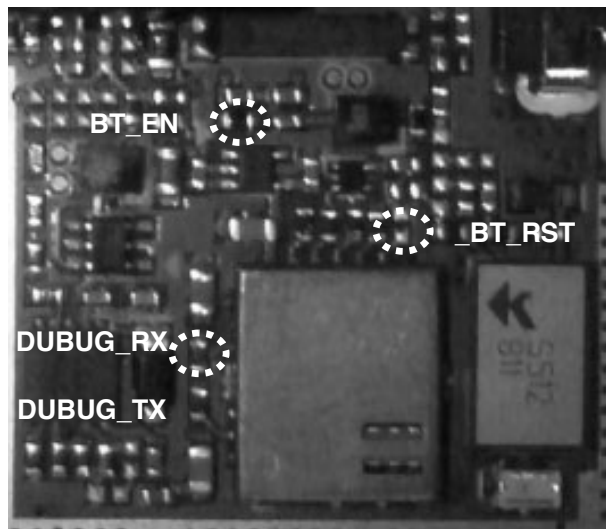
### Checking Flow



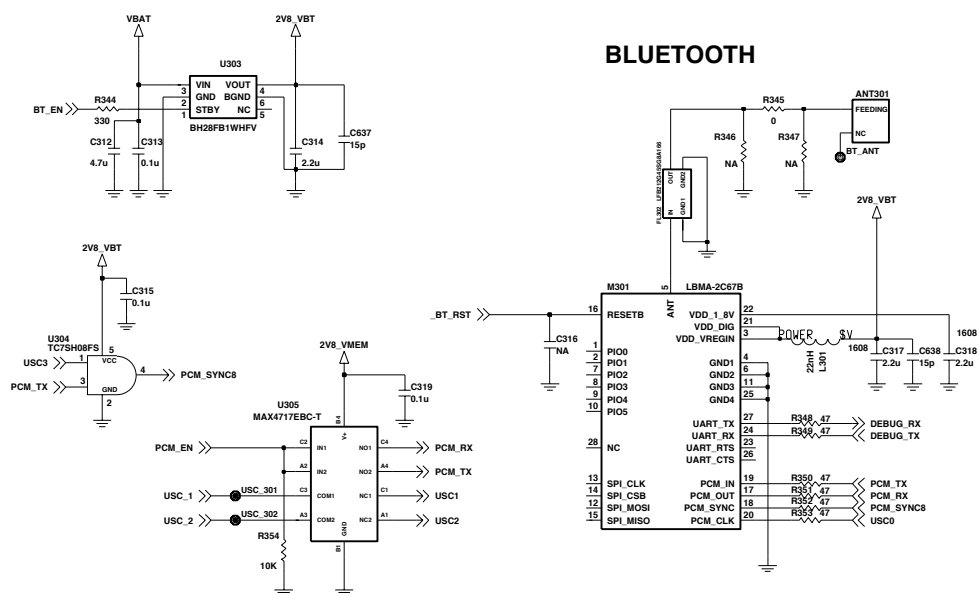
## 4. TROUBLE SHOOTING

### 4.7 BT Trouble

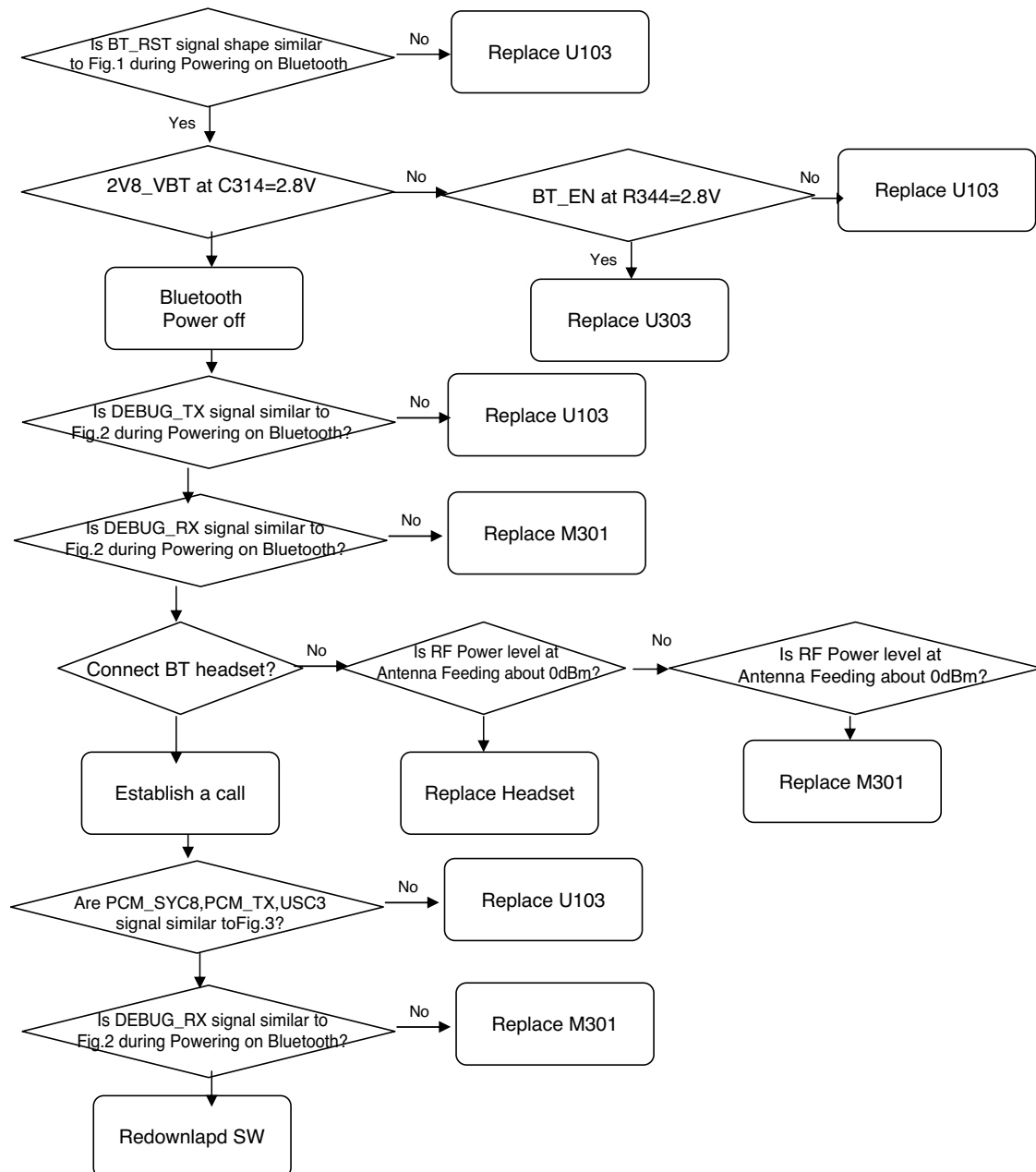
#### TEST POINT



#### CIRCUIT DIAGRAM



### Checking Flow





## 4. TROUBLE SHOOTING

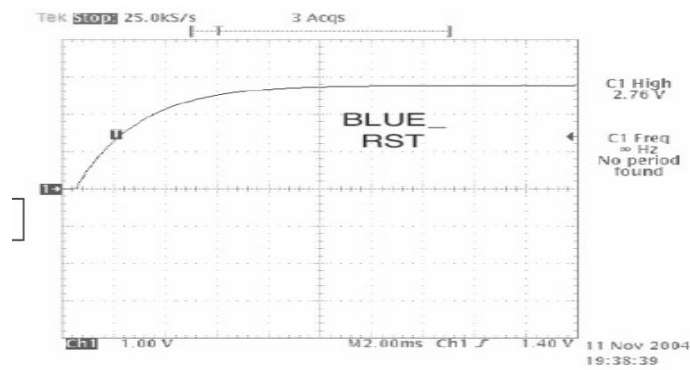


Figure 1 Blue\_RST

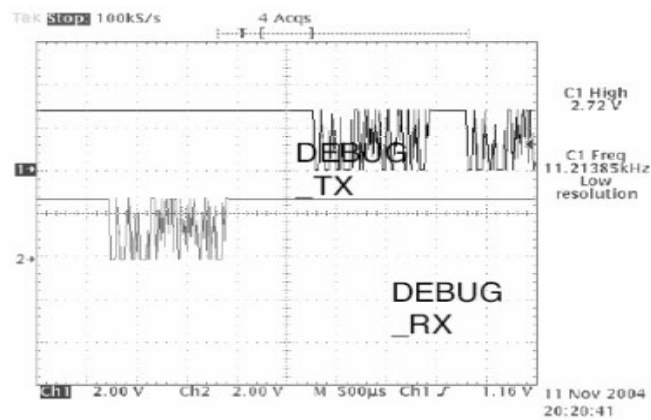


Figure 2 DEBUG\_Tx, Rx

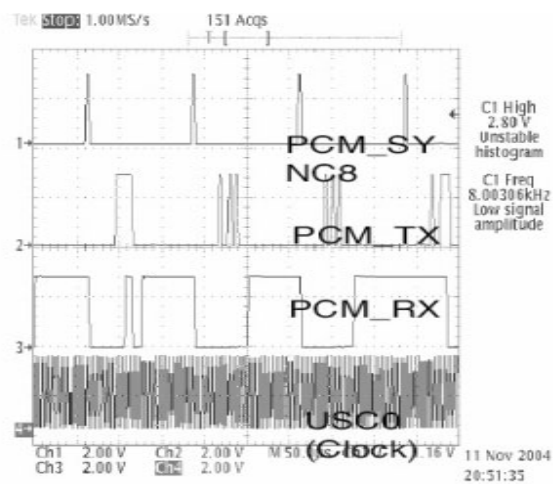


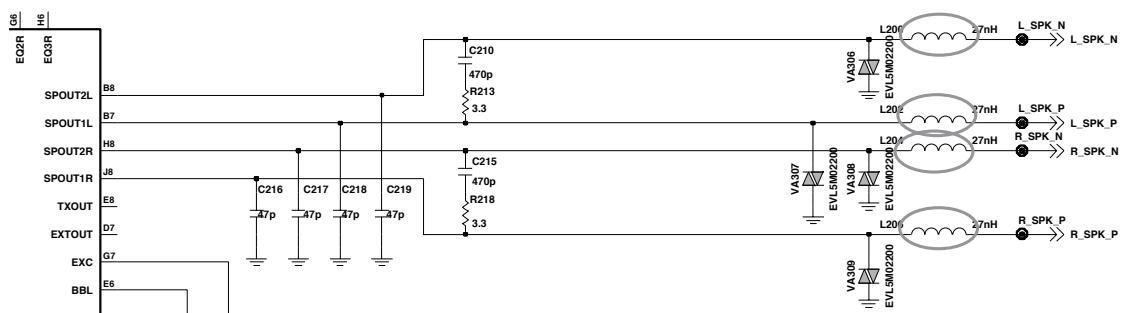
Figure 3 PCM\_SYNCS, Tx, Rx, USCO

### 4.8 Speaker Trouble

#### TEST POINT



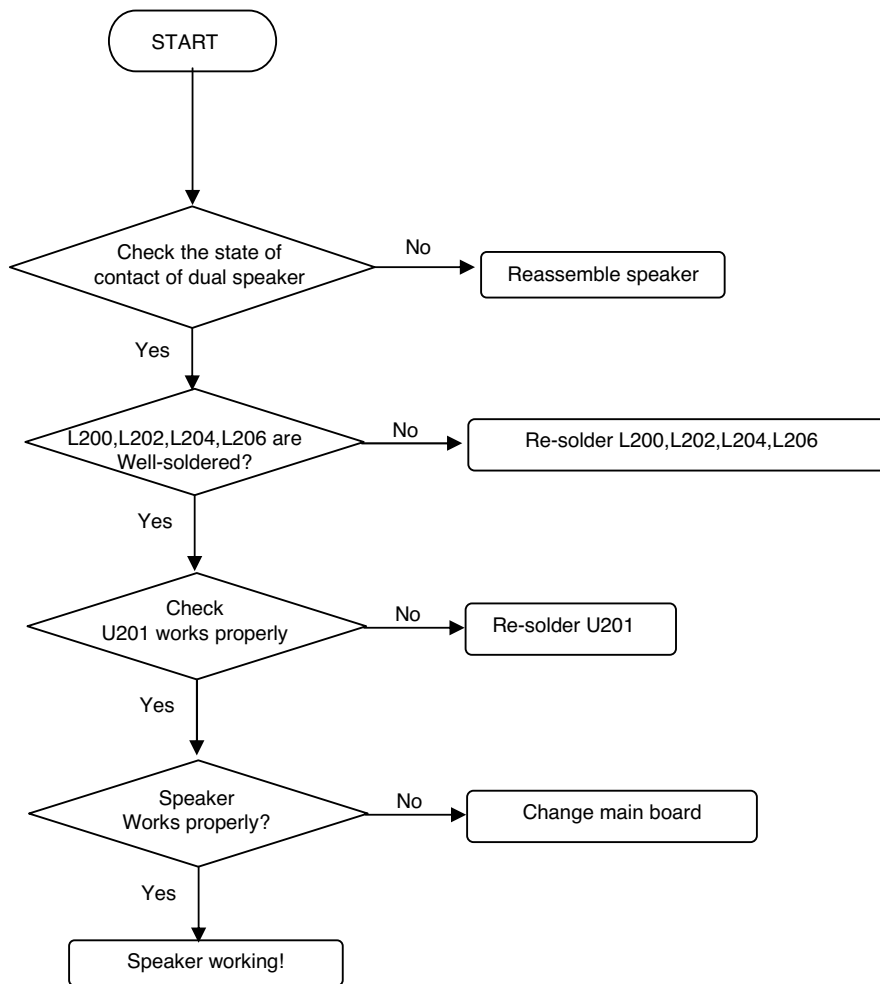
#### CIRCUIT DIAGRAM



## 4. TROUBLE SHOOTING

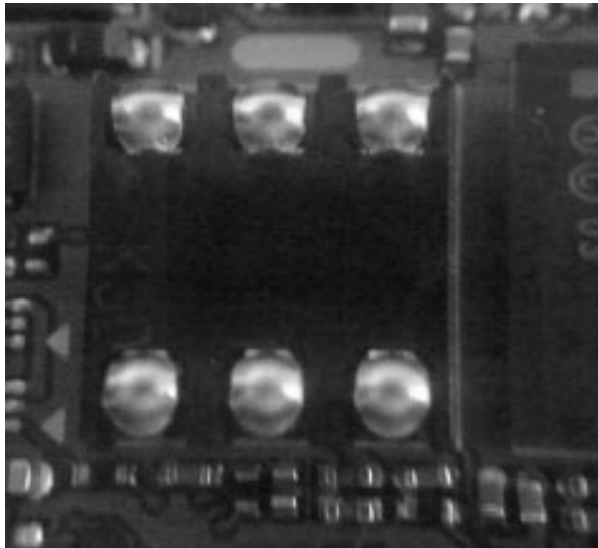
---

### Checking Flow



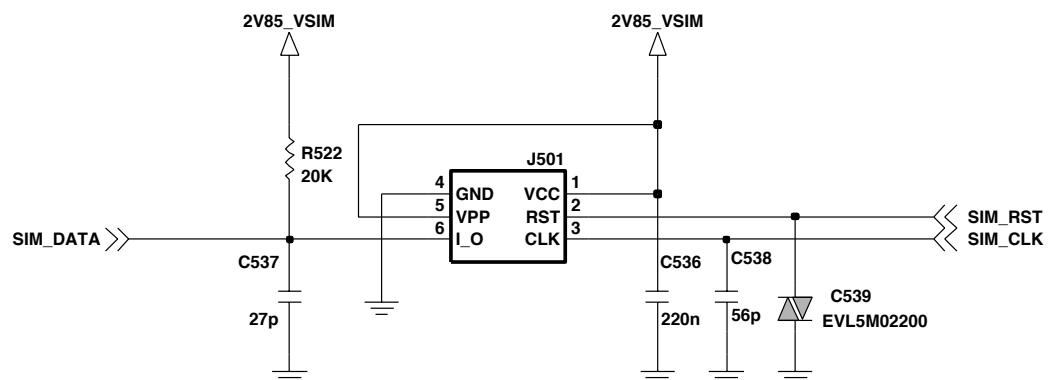
### 4.9 SIM Card Interface Trouble

#### TEST POINT



#### CIRCUIT DIAGRAM

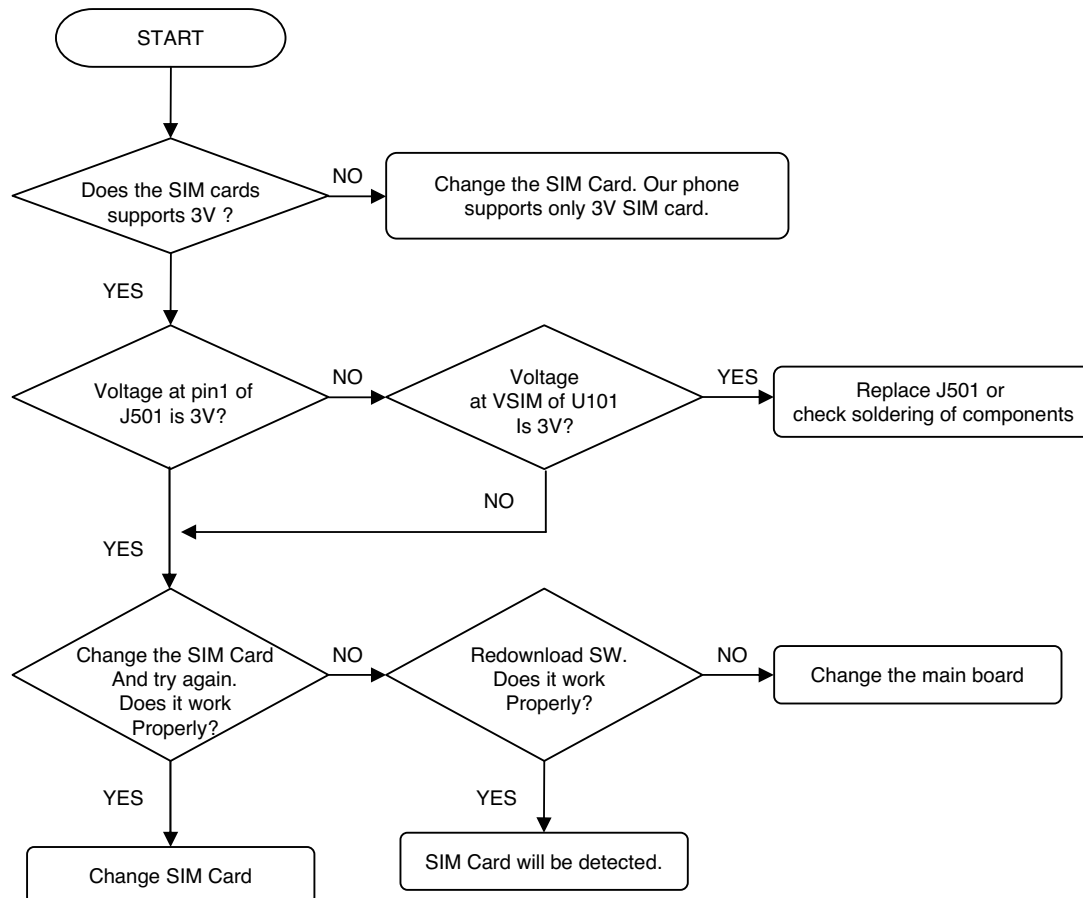
### SIM CONNECTOR



## 4. TROUBLE SHOOTING

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### Checking Flow

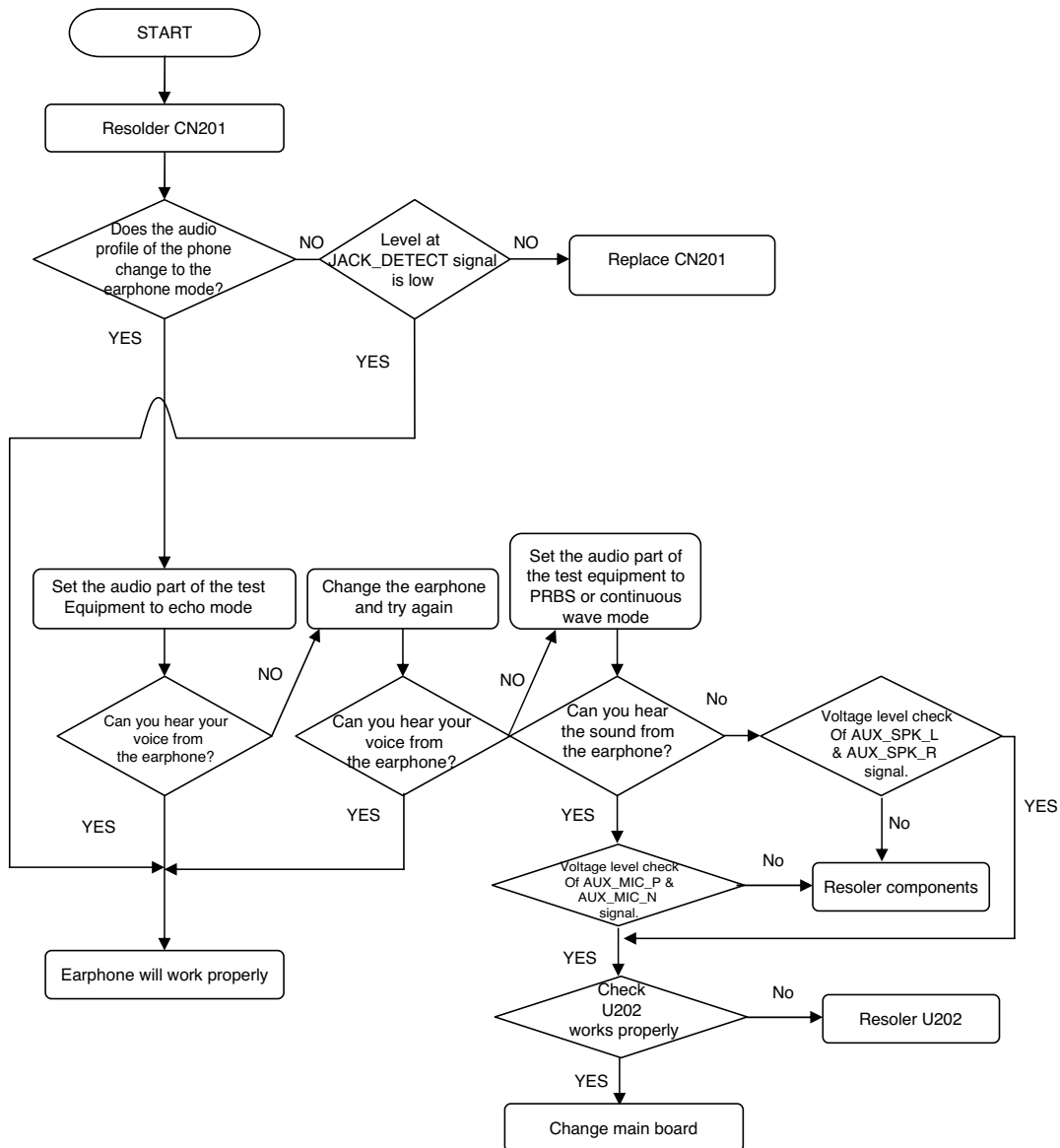


### TEST POINT



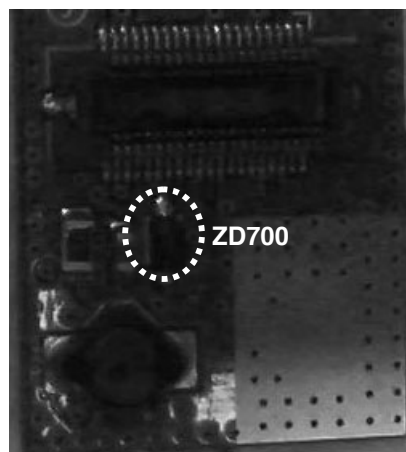
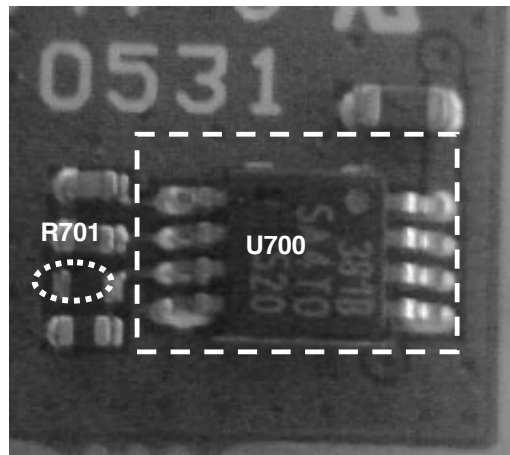
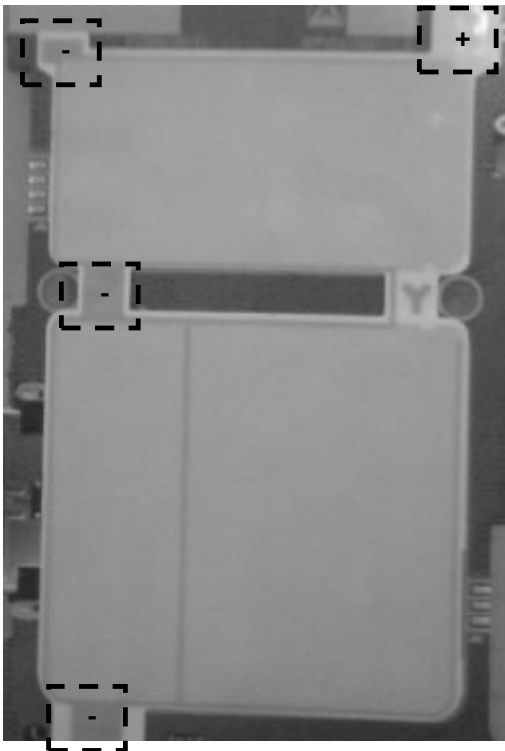
## 4. TROUBLE SHOOTING

### Checking Flow



### 4.11 EL Trouble

#### TEST POINT

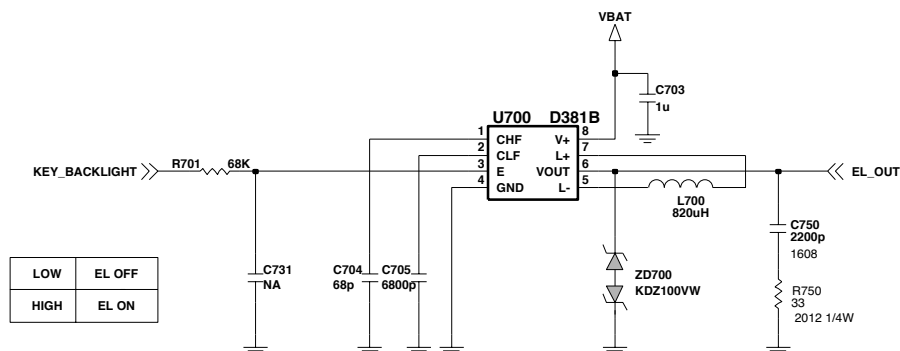




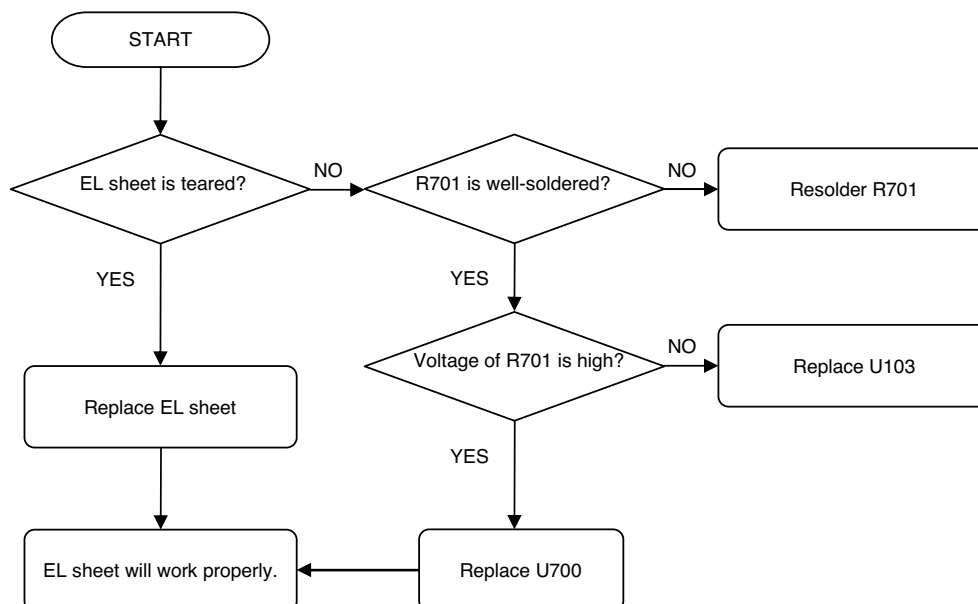
## 4. TROUBLE SHOOTING

### CIRCUIT DIAGRAM

#### EL DRIVER IC



### Checking Flow

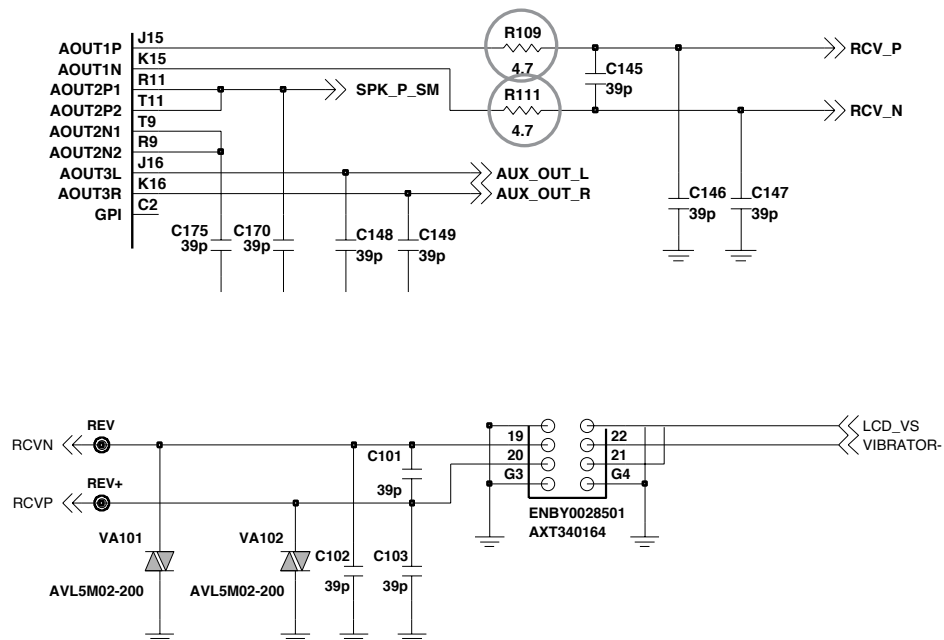


### 4.12 Receiver Trouble

#### TEST POINT



#### CIRCUIT DIAGRAM



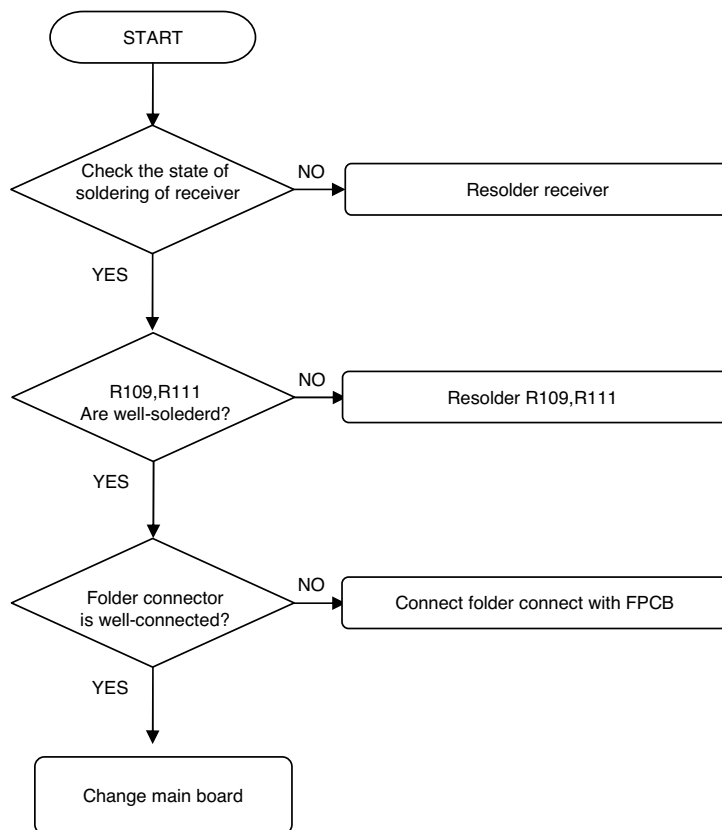
## 4. TROUBLE SHOOTING

---

### Checking Flow

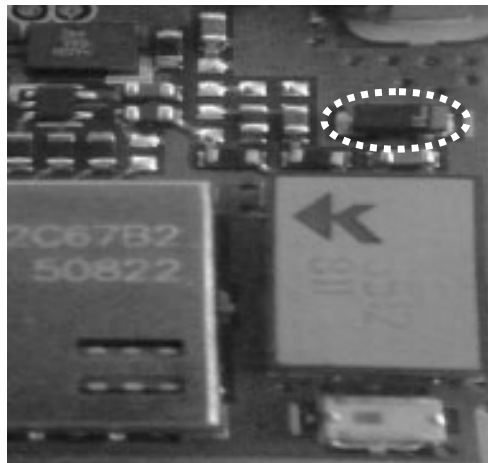
SETTING : After initialize Agilent 8960, Test EGSM, DCS mode

Set the property of audio as PRBS or continuous wave. Set the receiving volume of mobile as Max.

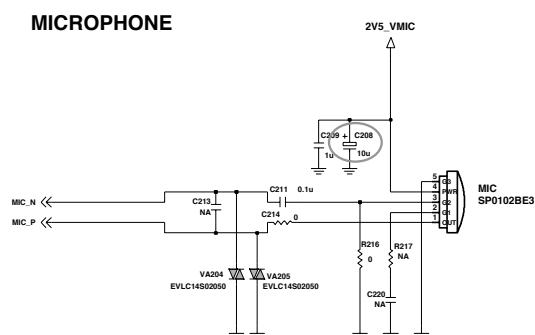
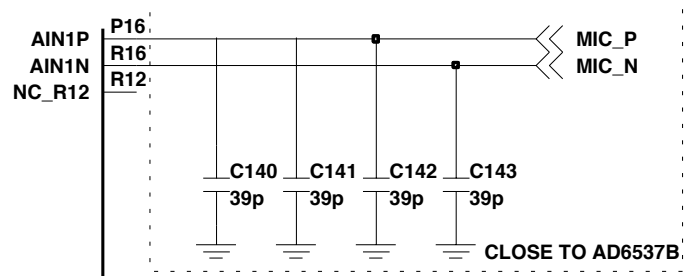


### 4.13 Microphone Trouble

#### TEST POINT



#### CIRCUIT DIAGRAM

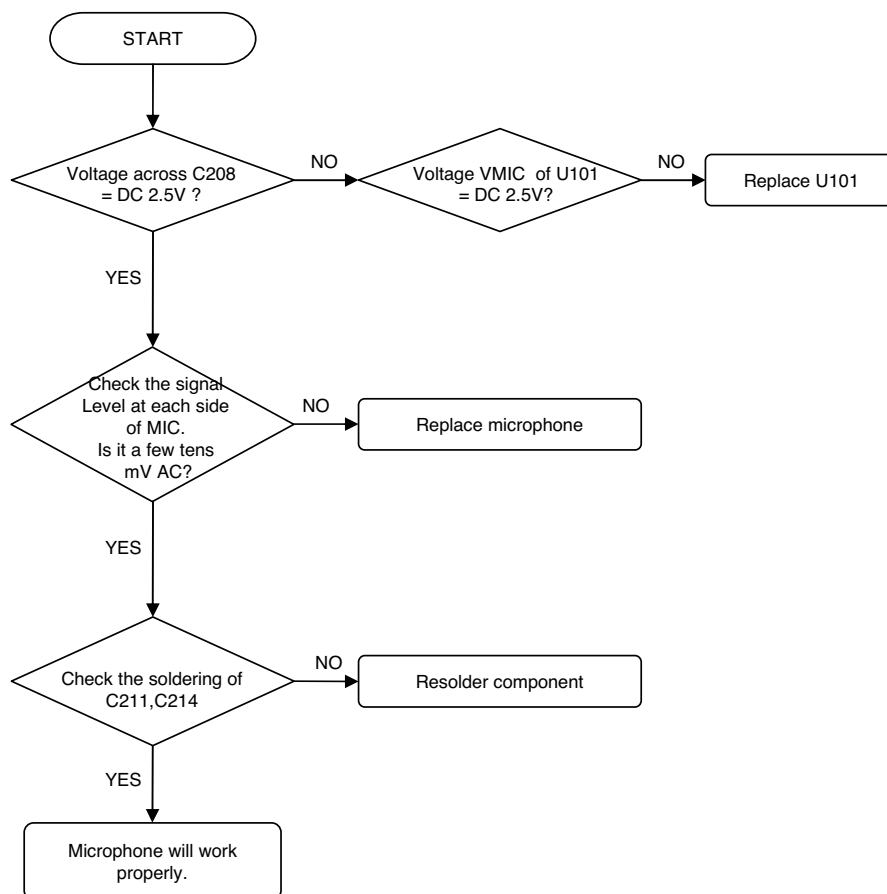


## 4. TROUBLE SHOOTING

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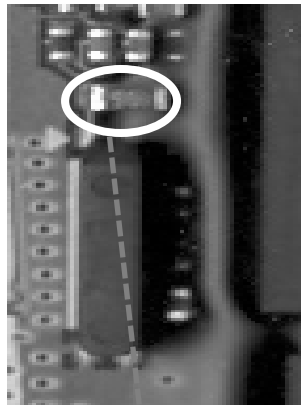
### Checking Flow

SETTING : After initialize Agilent 8960, Test EGSM, DCS mode

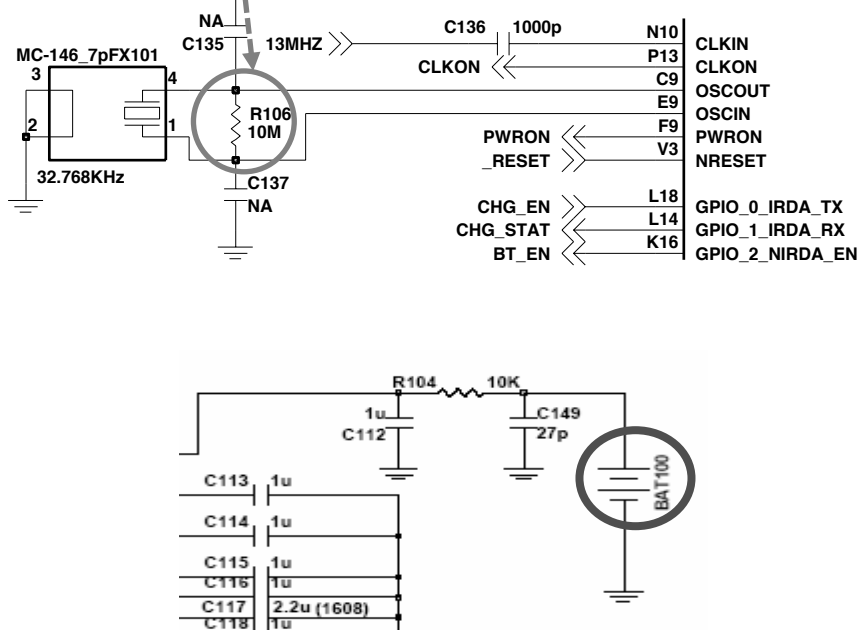


### 4.14 RTC Trouble

#### TEST POINT



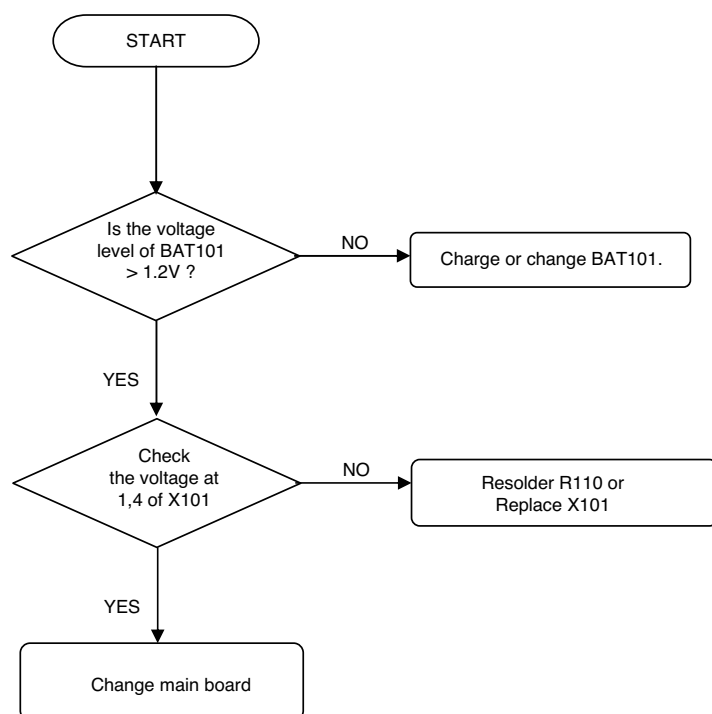
#### CIRCUIT DIAGRAM



## 4. TROUBLE SHOOTING

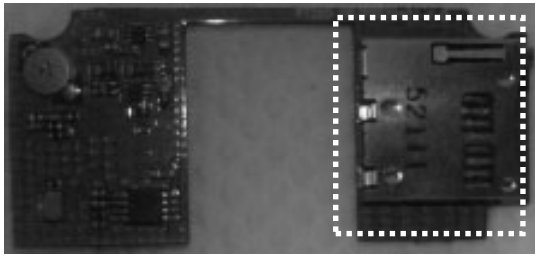
---

### Checking Flow

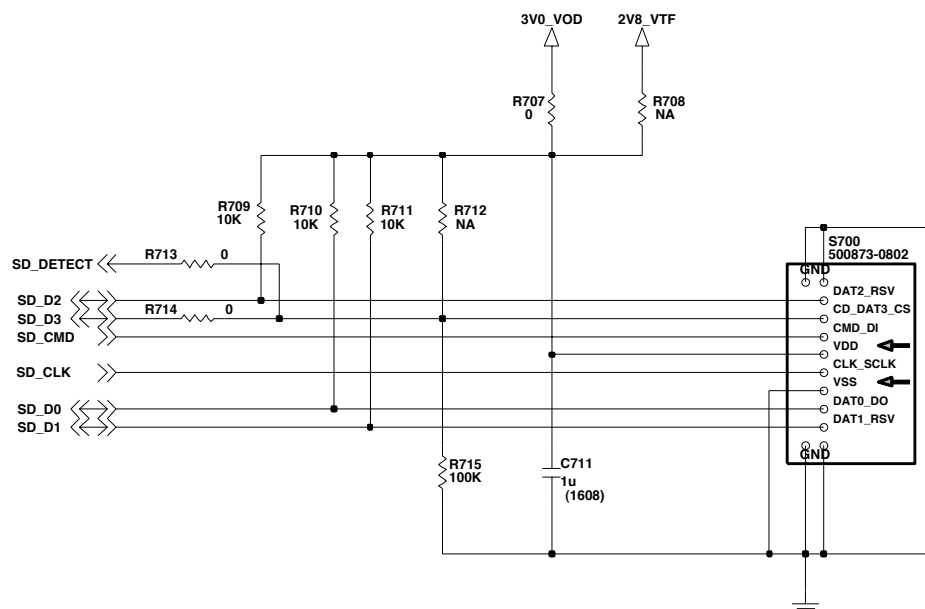


## 4.15 T-Flash

## Test Points



### Circuit Diagram

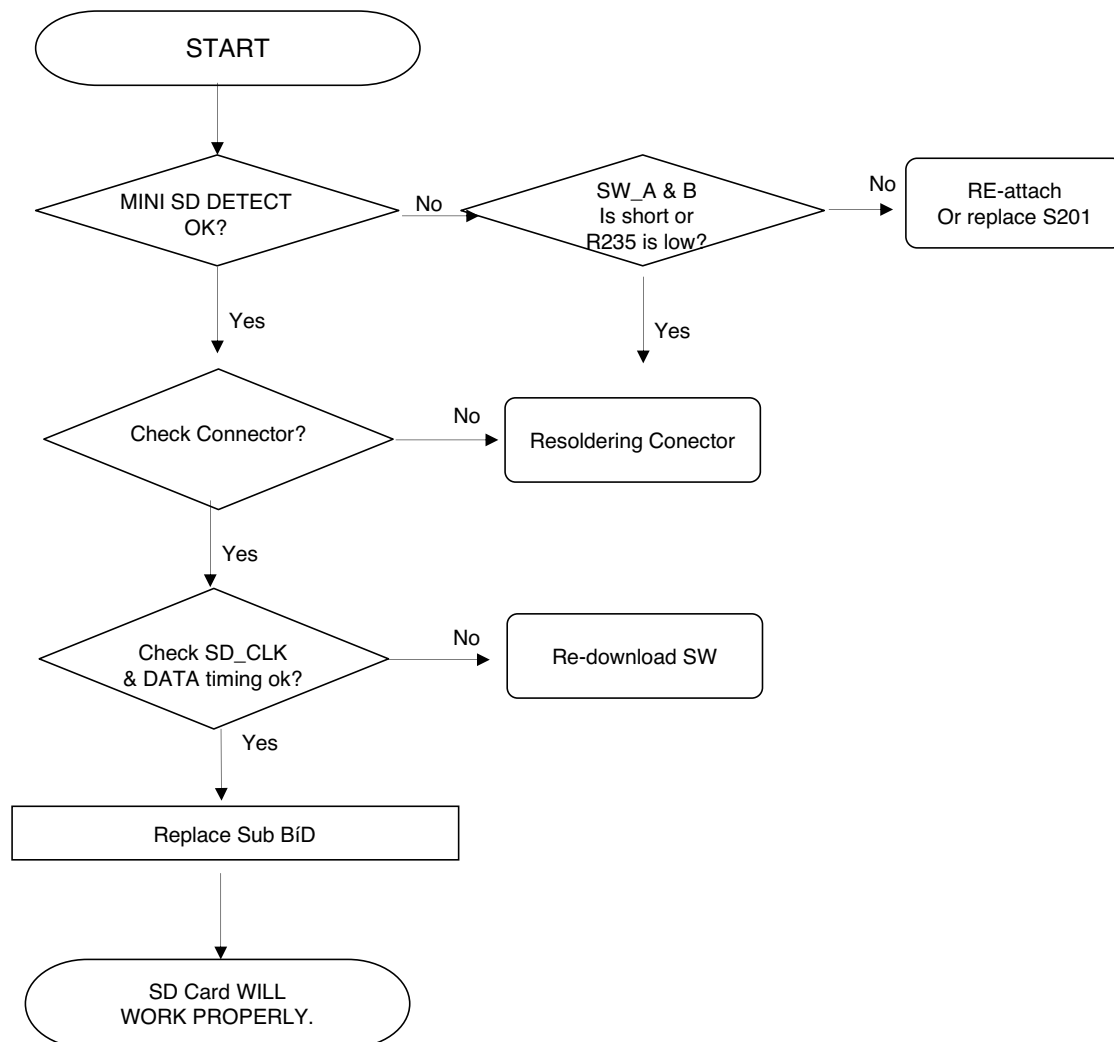




## 4. TROUBLE SHOOTING

---

### Checking Flow

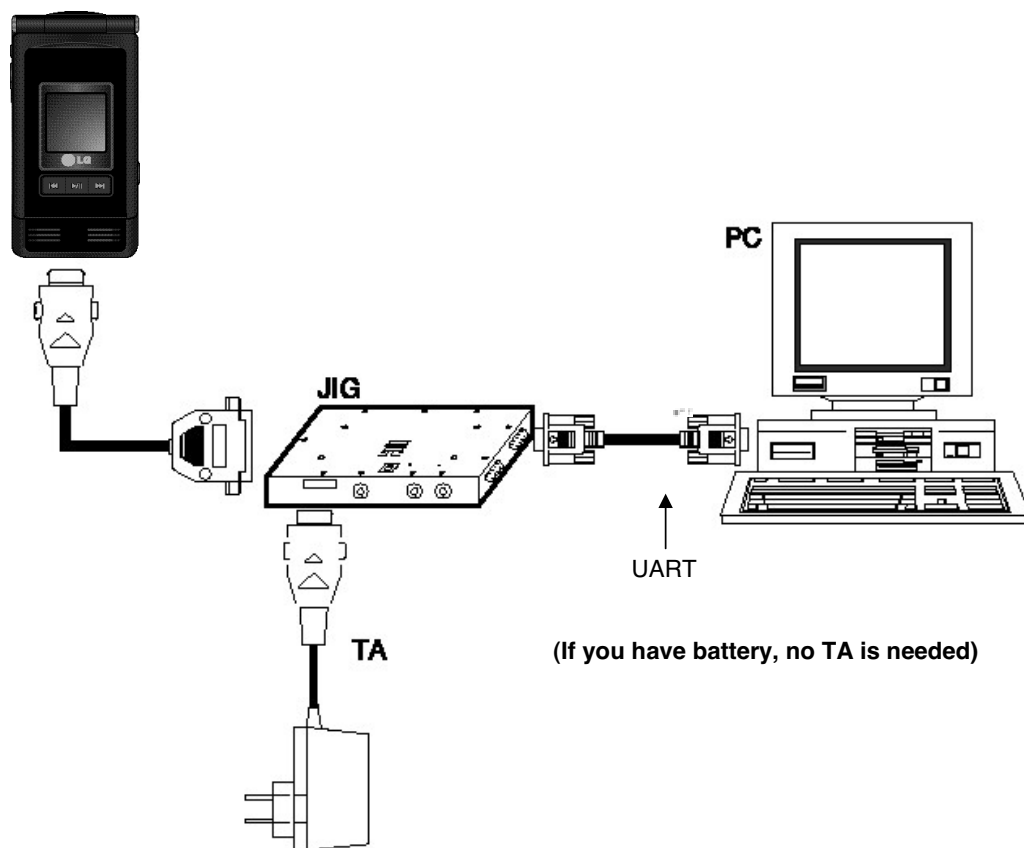


# 5. DOWNLOAD AND CALIBRATION

## 5.1 Download

### A. Download Setup

Figure 5-1 describes Download setup

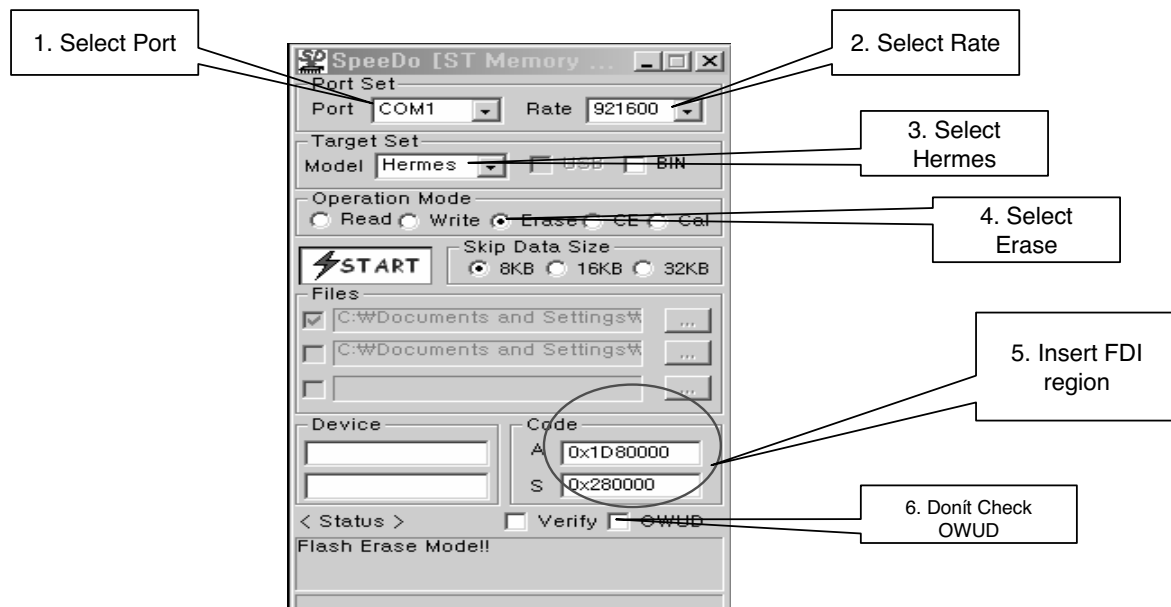


**Figure 5-1. Download Setup**

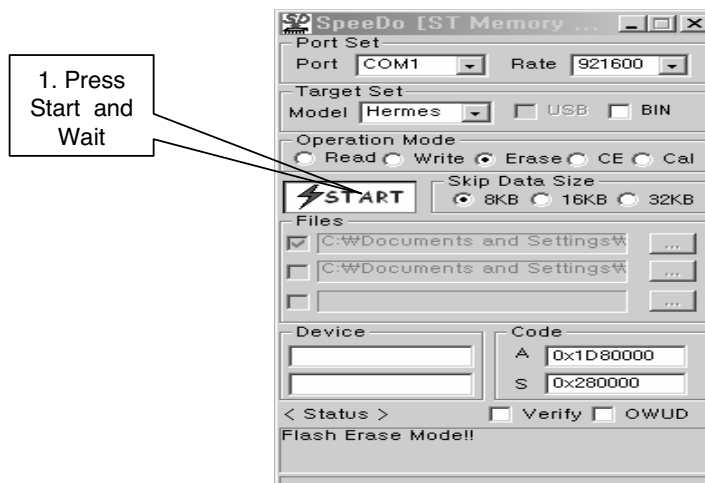
## 5. DOWNLOAD AND CALIBRATION

### B. Download Procedure

1. Access Flash loader program in PC and select Erase.(Don't check OWUD)

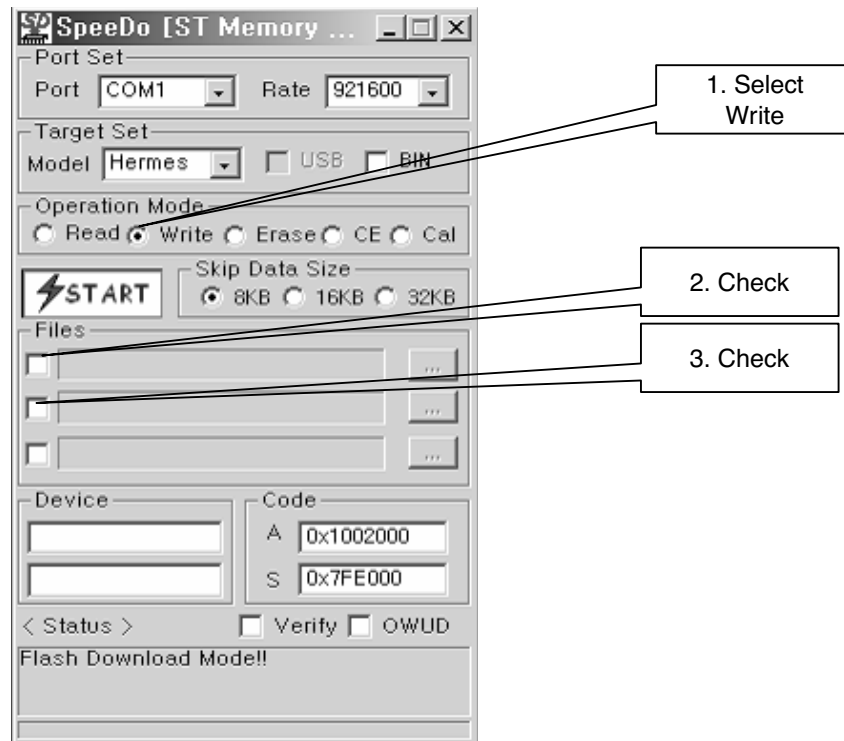


2. Press Start and Wait until Erase is completed.



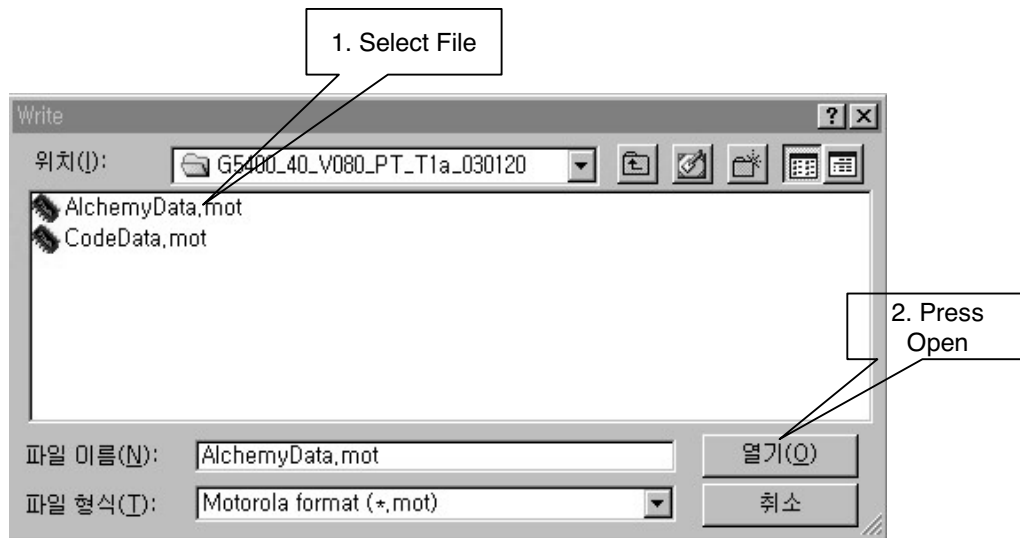
## 5. DOWNLOAD AND CALIBRATION

3. Press Write to start Download and press  Key to choose software (AlchemyData.mot)

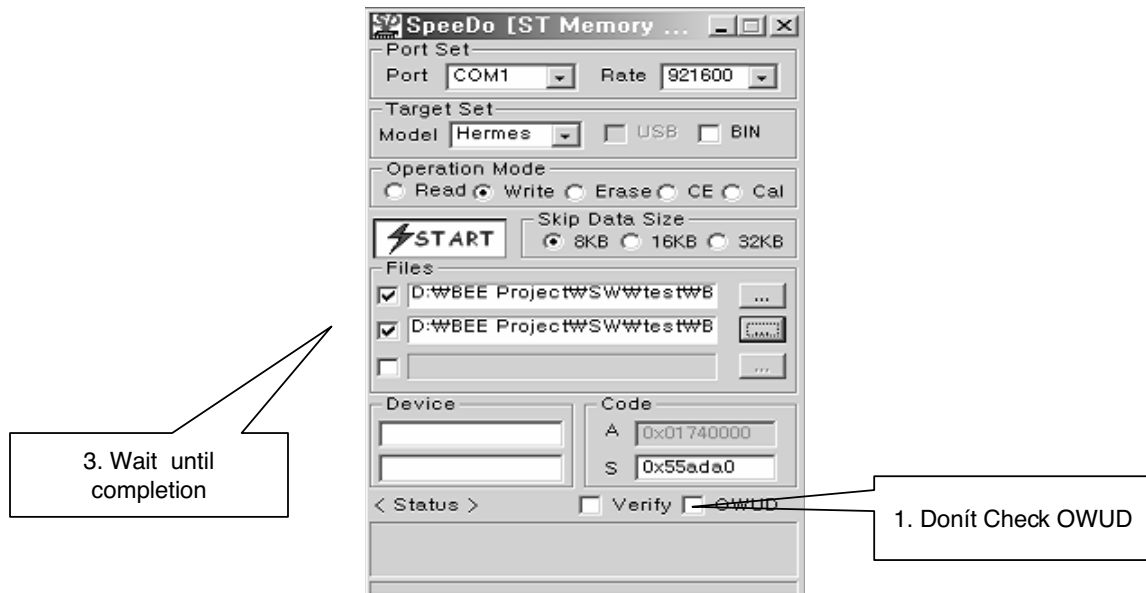


## 5. DOWNLOAD AND CALIBRATION

### 4. Choose software

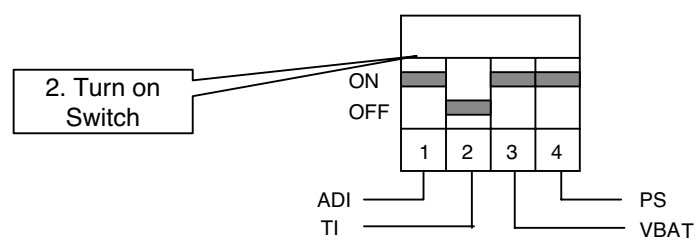
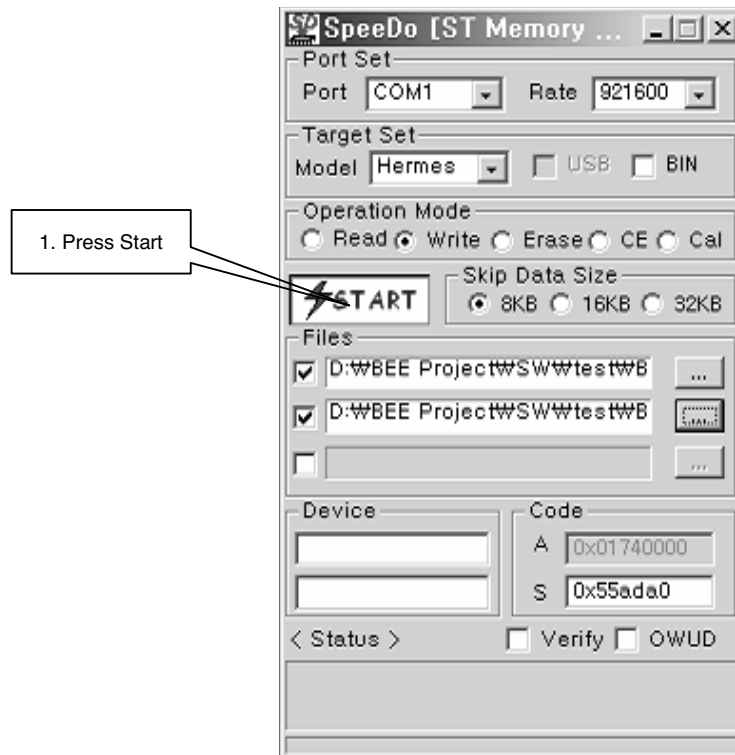


### 5. Wait until converting from MOT to BIF is completed(Don't check OWUD)



## 5. DOWNLOAD AND CALIBRATION

6. Press Start and Power on the phone using JIG remote Power on(Switch 1)



## 5. DOWNLOAD AND CALIBRATION

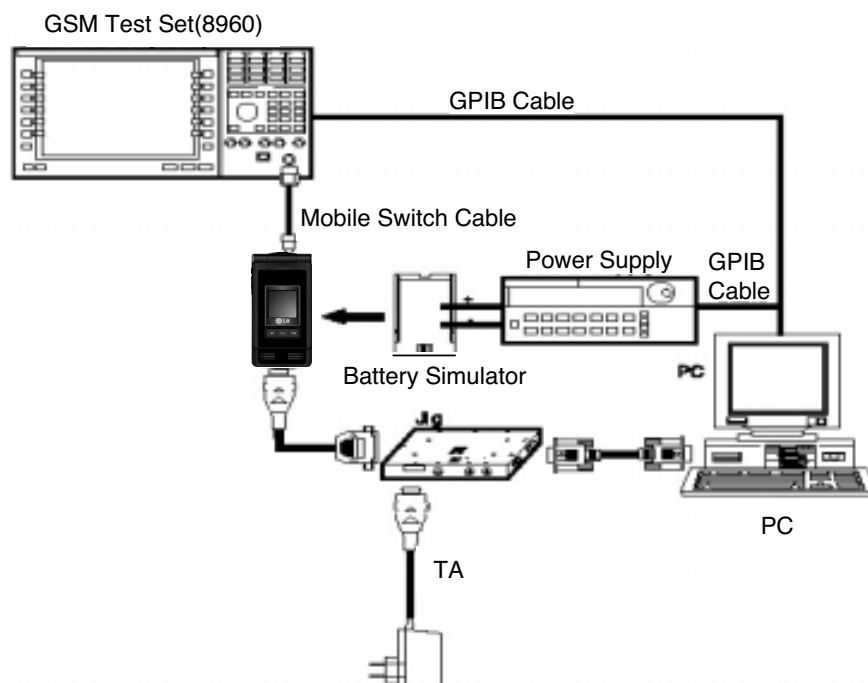
### 5.2 Calibration

#### A. Equipment List

**Table 5-1. Calibration Equipment List.**

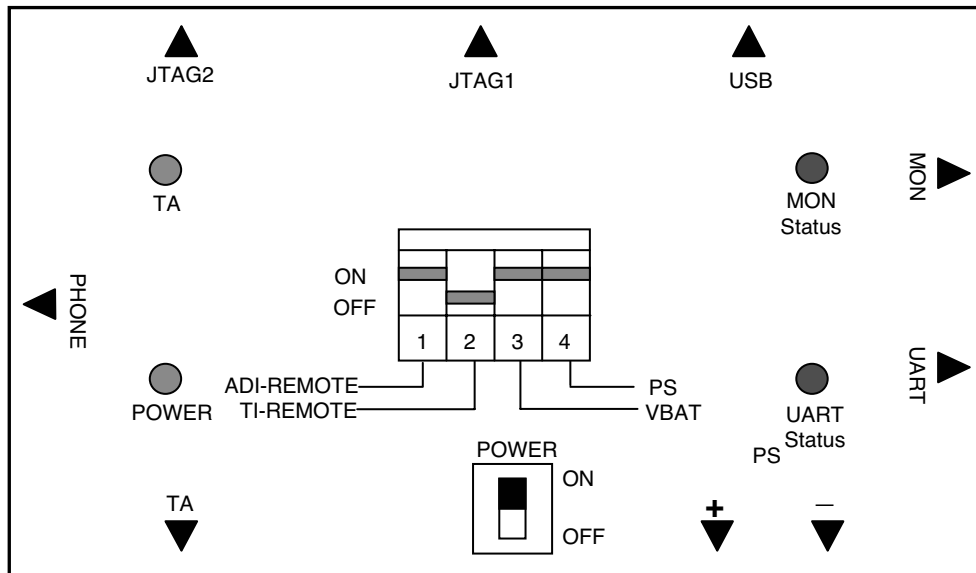
Equipment for Calibration	Type / Model	Brand
Wireless Communication Test Set	HP-8960	Agilent
RS-232 Cable and Test JIG		LG
RF Cable		LG
Power Supply	HP-66311B	Agilent
GPIO interface card	HP-GPIB	Agilent
Calibration & Final test software		LG
Test SIM Card		
PC (for Software Installation)	Pentium II class above 300MHz	

#### B. Equipment Setup



**Figure 6-2. Equipment Setup**

## 5. DOWNLOAD AND CALIBRATION



**Figure 5-3 The top view of Test JIG**

### C. Test Jig Operation

Power Source	Description
Power Supply	Usually 4.0V
Travel Adaptor	Use TA, name is TA-20G(24pin)

**Table 5-2 Jig Power**

Switch Number	Name	Description
Switch 1	ADI-REMOTE	In ON state, phone is awaked. It is used ADI chipset.
Switch 2	TI-REMOTE	In ON state, phone is awaked. It is used TI chipset.
Switch 3	VBAT	Power is provided for phone from battery
Switch 4	PS	Power is provided for phone from Power supply

**Table 5-3 Jig DIP Switch**



## 5. DOWNLOAD AND CALIBRATION

---

LED Number	Name	Description
LED 1	Power	Power is provided for Test Jig
LED 2	TA	Indicate charging state of the phone battery
LED 3	UART	Indicate data transfer state through the UART port
LED 4	MON	Indicate data transfer state through the MON port

**Table 5-4 LED Description**

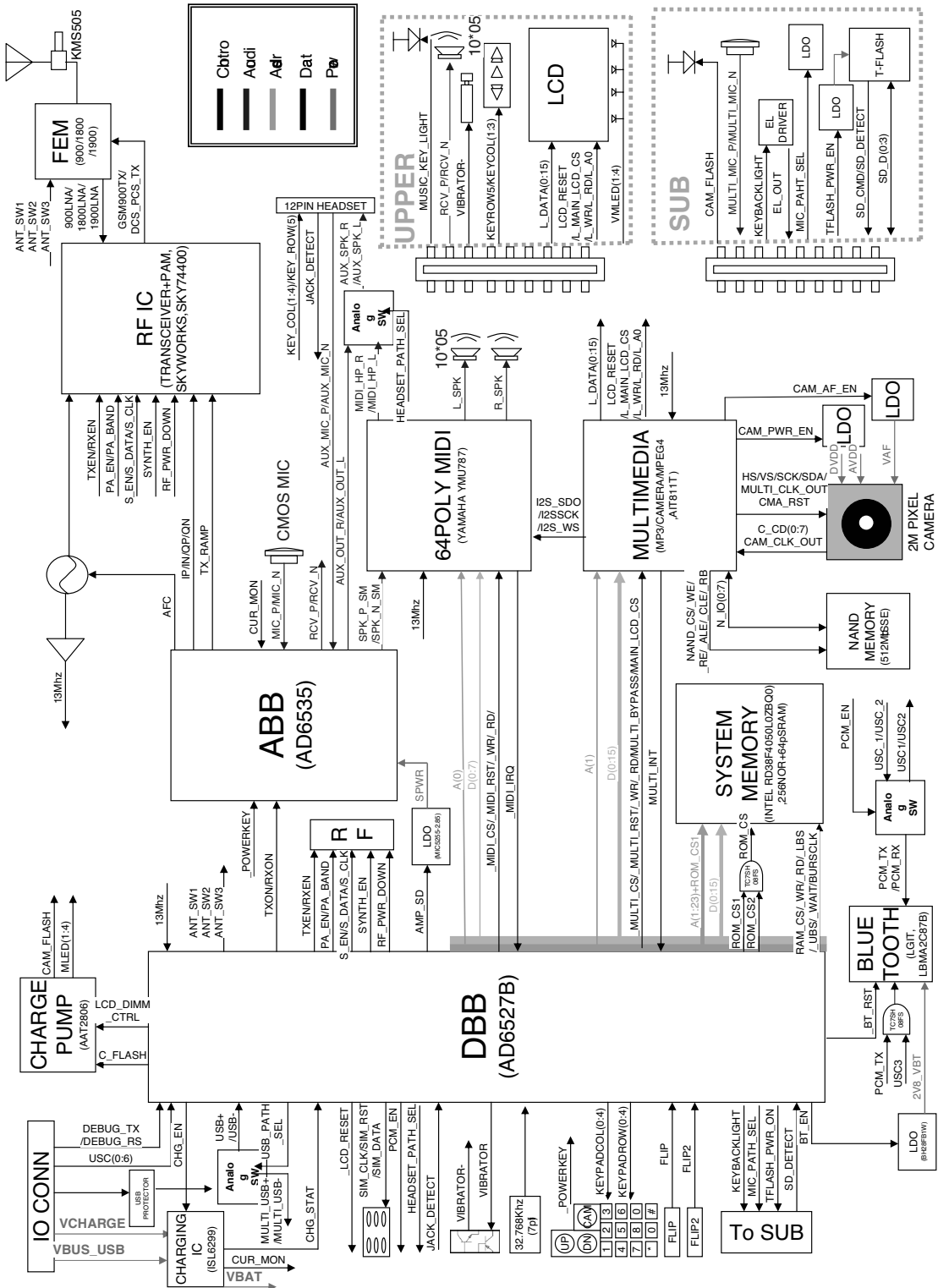
1. Connect as Fig 6-2(RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general)
2. Set the Power Supply 4.0V
3. Set the 3<sup>rd</sup>, 4<sup>th</sup> of DIP SW ON state always
4. Press the Phone power key, if the Remote ON is used, 1<sup>st</sup> ON state

### **D. Procedure**

1. Connect as Fig 6-2(RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general)
2. Power ON PC then enter into Windows 98(Remark : Windows 2000 system could be feasible)
3. Run AUTOCAL.exe, the AUTOCAL application window will be appeared.

## 6. BLOCK DIAGRAM - Base Band

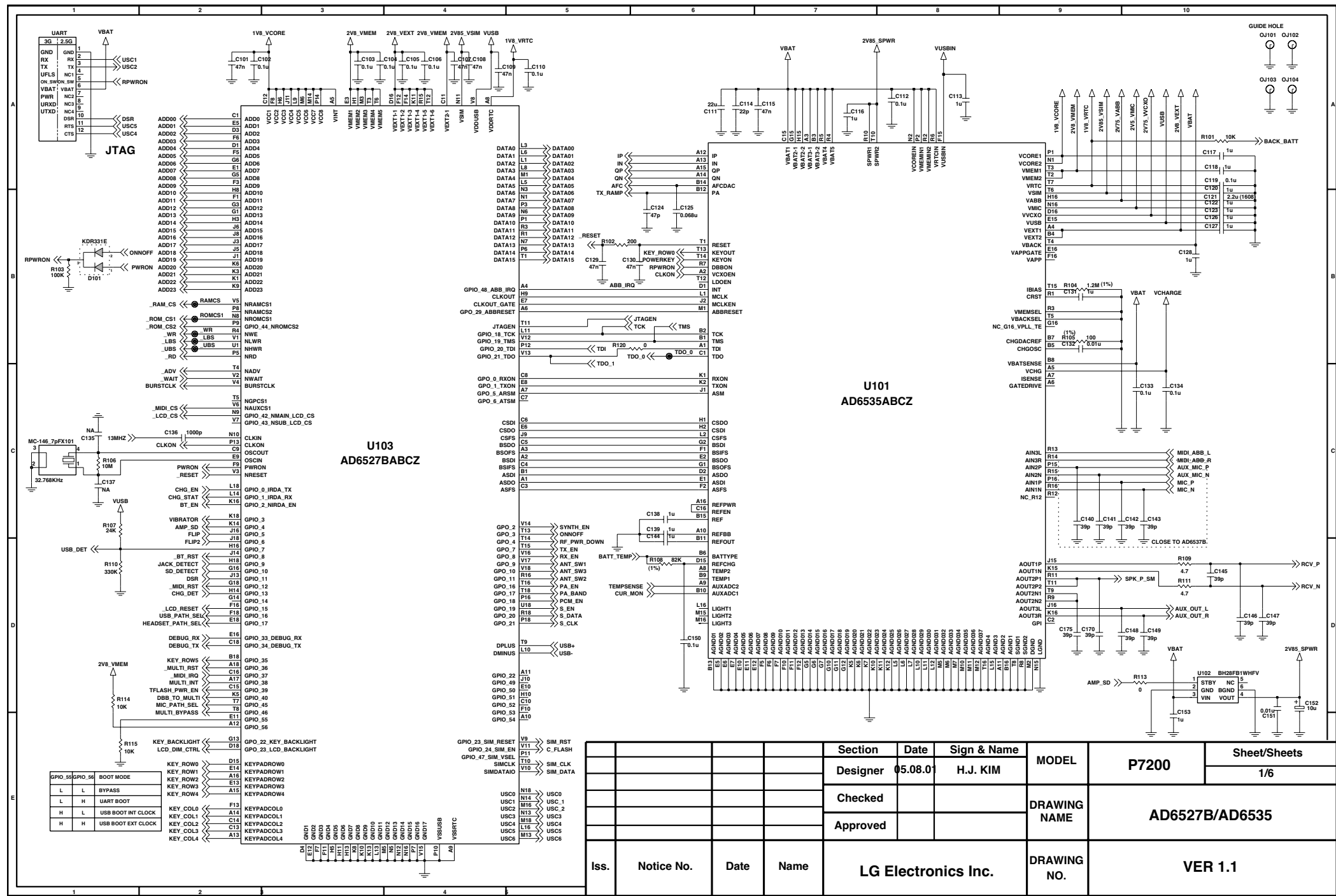
## 6. BLOCK DIAGRAM - Base Band



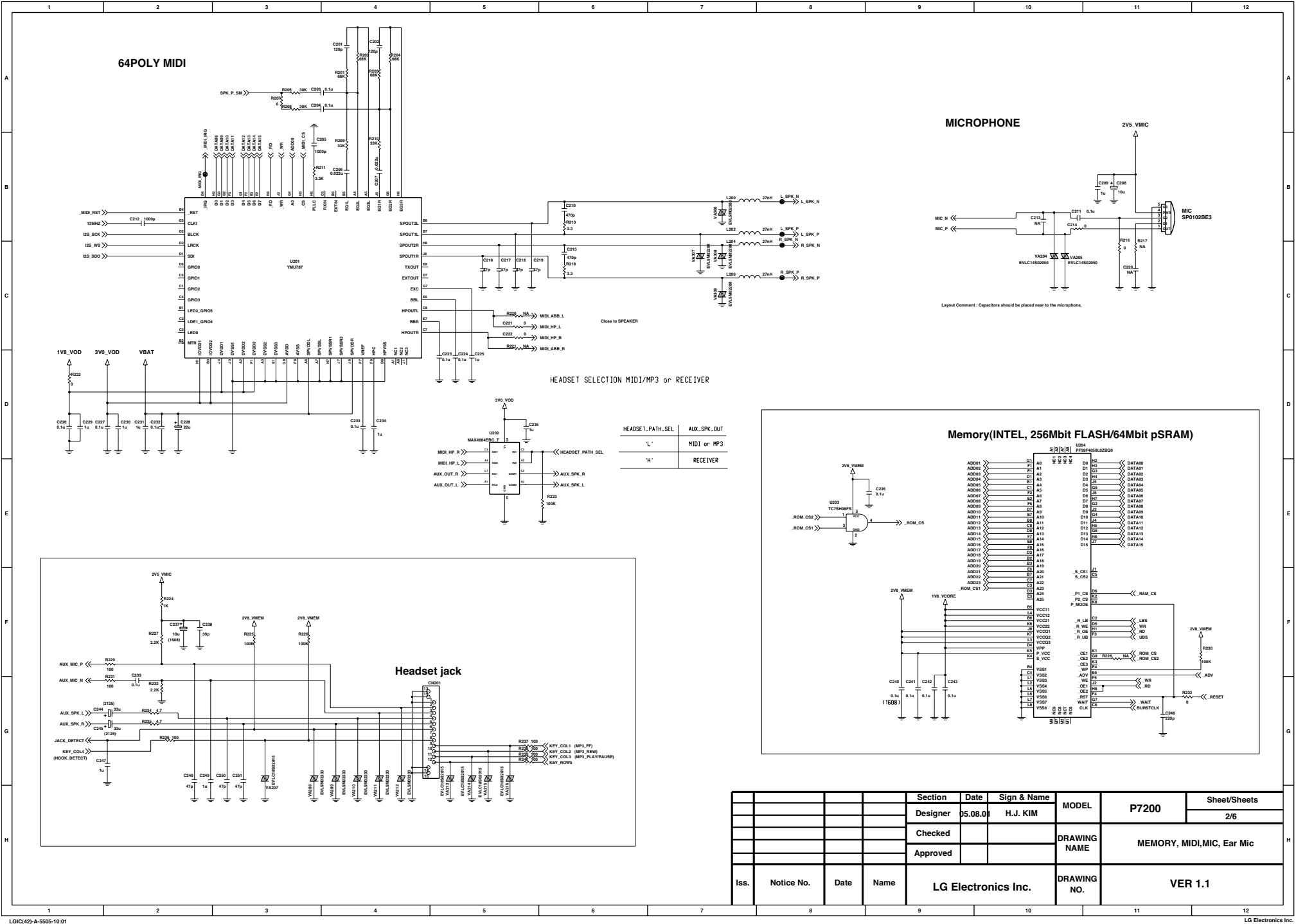
## Note

---

## 7. CIRCUIT DIAGRAM



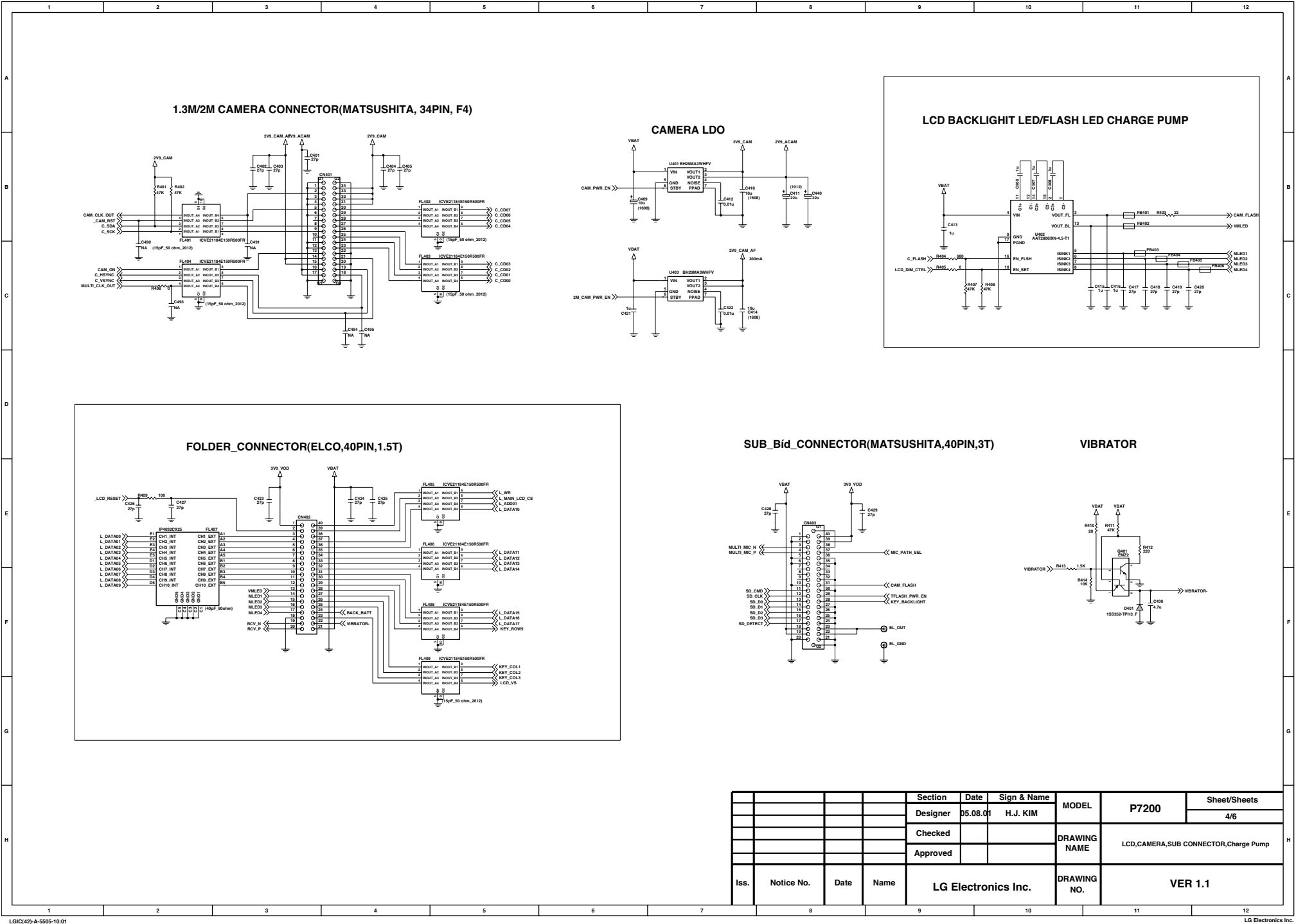
7. CIRCUIT DIAGRAM



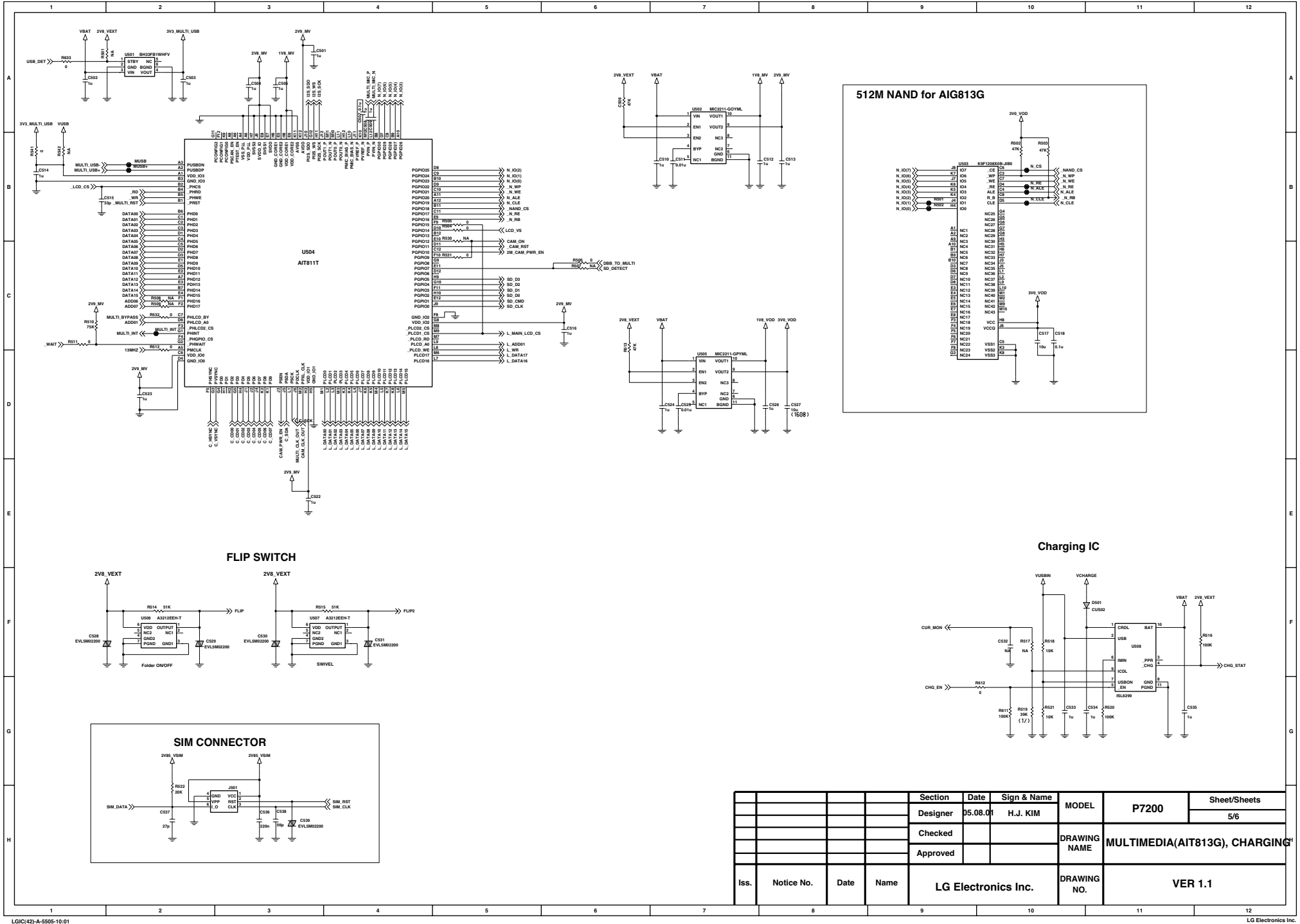
				Section	Date	Sign & Name	MODEL	P7200	Sheet/Sheets
				Designer	05.08.0	H.J. KIM			2/6
				Checked			DRAWING NAME	MEMORY, MIDI,MIC, Ear Mic	
				Approved					
Iss.	Notice No.	Date	Name	LG Electronics Inc.			DRAWING NO.	VER 1.1	



# 7. CIRCUIT DIAGRAM



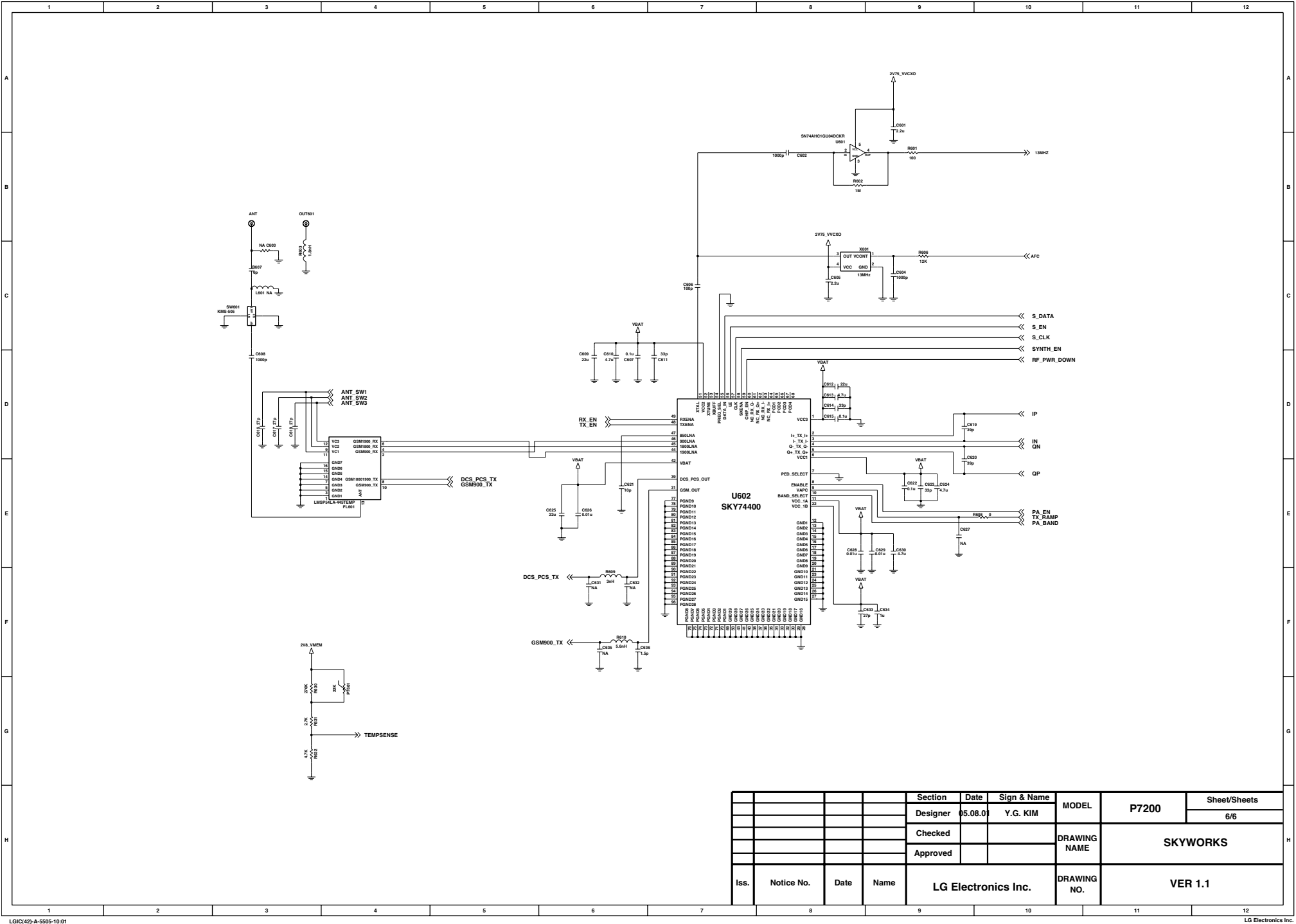
7. CIRCUIT DIAGRAM



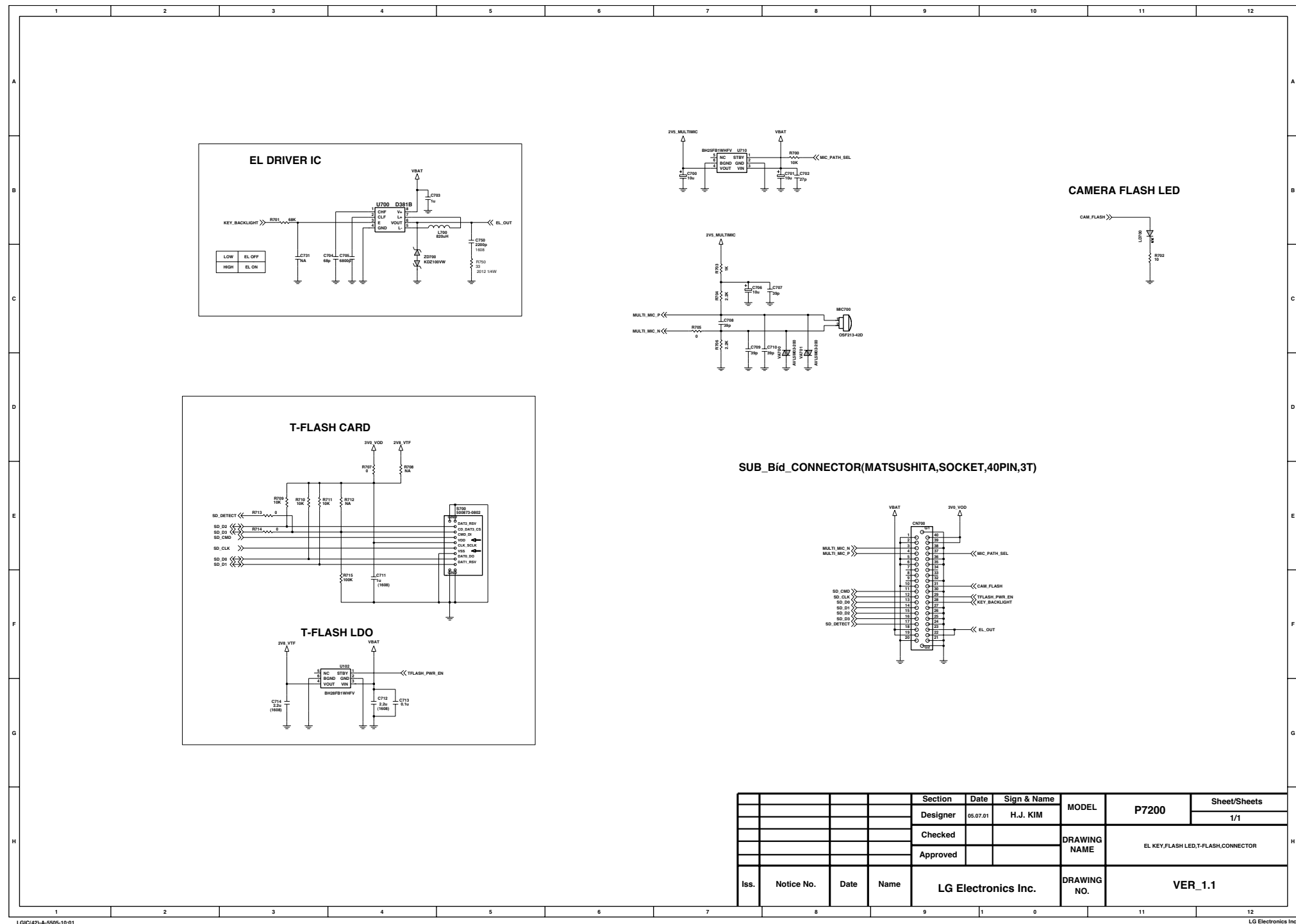
				Section	Date	Sign & Name	MODEL	P7200	Sheet/Sheets
				Designer	05.08.01	H.J. KIM			5/6
				Checked			DRAWING NAME	MULTIMEDIA(AIT813G), CHARGING	
				Approved			DRAWING NO.	VER 1.1	
Iss.	Notice No.	Date	Name	LG Electronics Inc.					



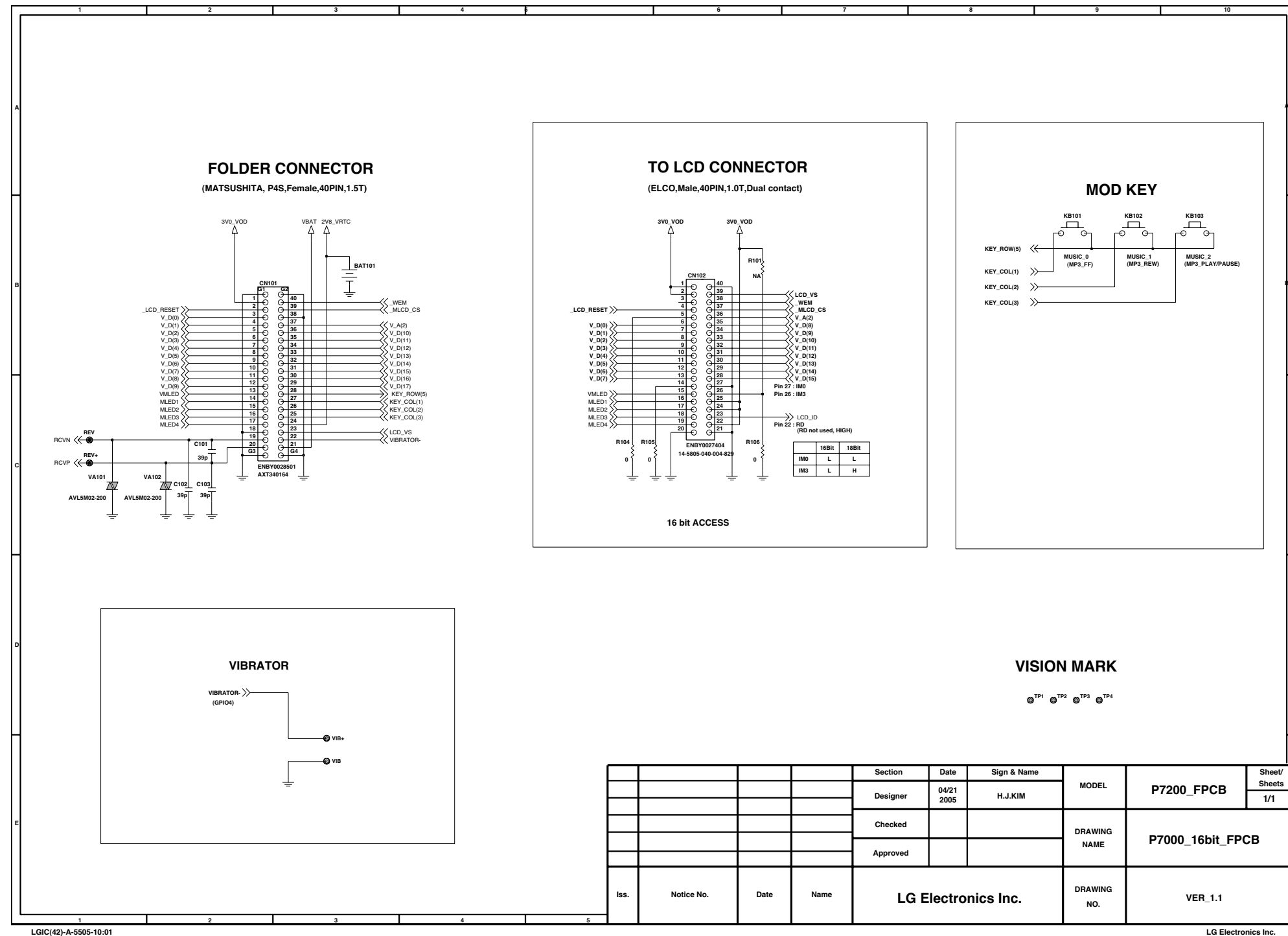
7. CIRCUIT DIAGRAM



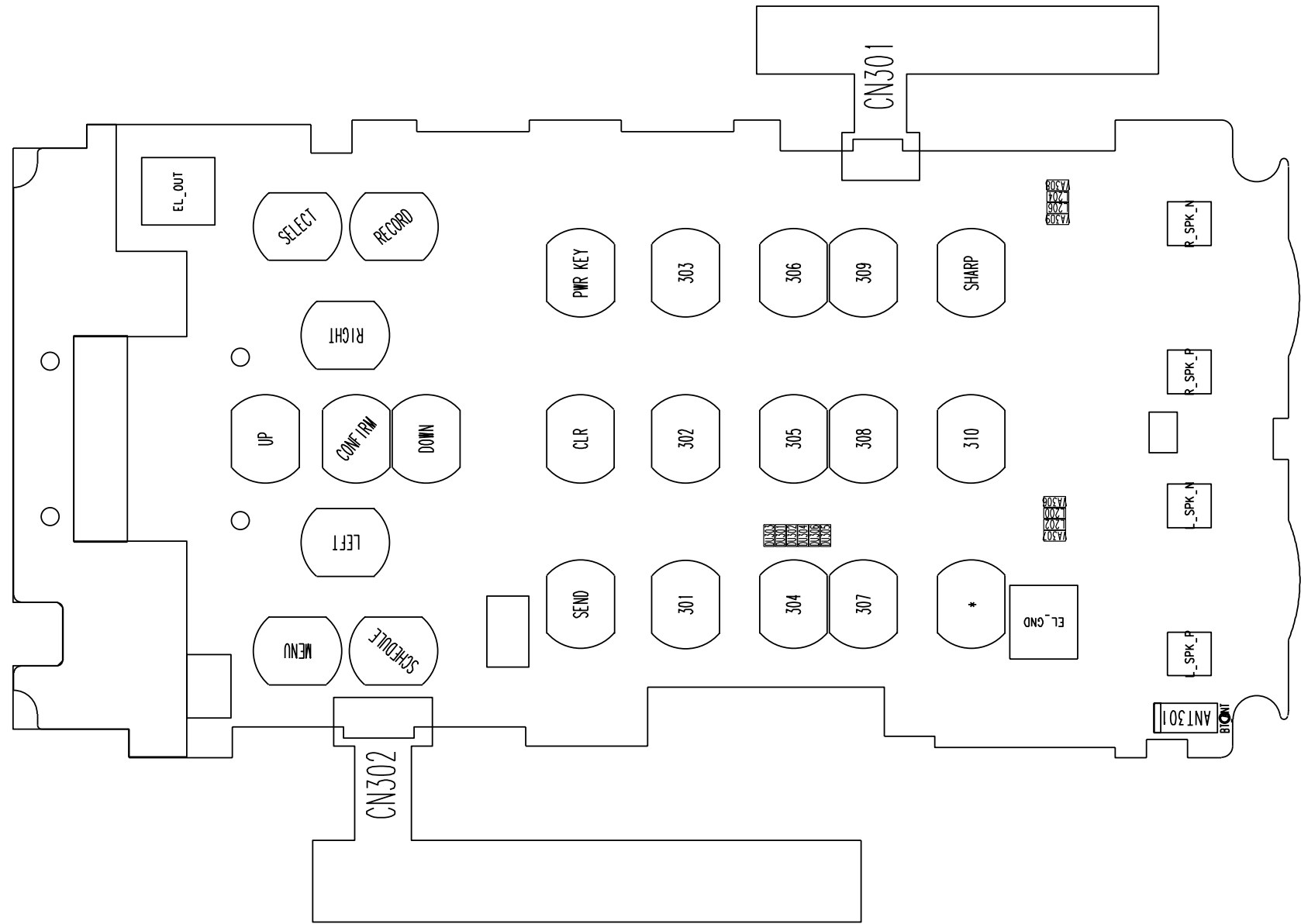
## 7. CIRCUIT DIAGRAM



## 7. CIRCUIT DIAGRAM

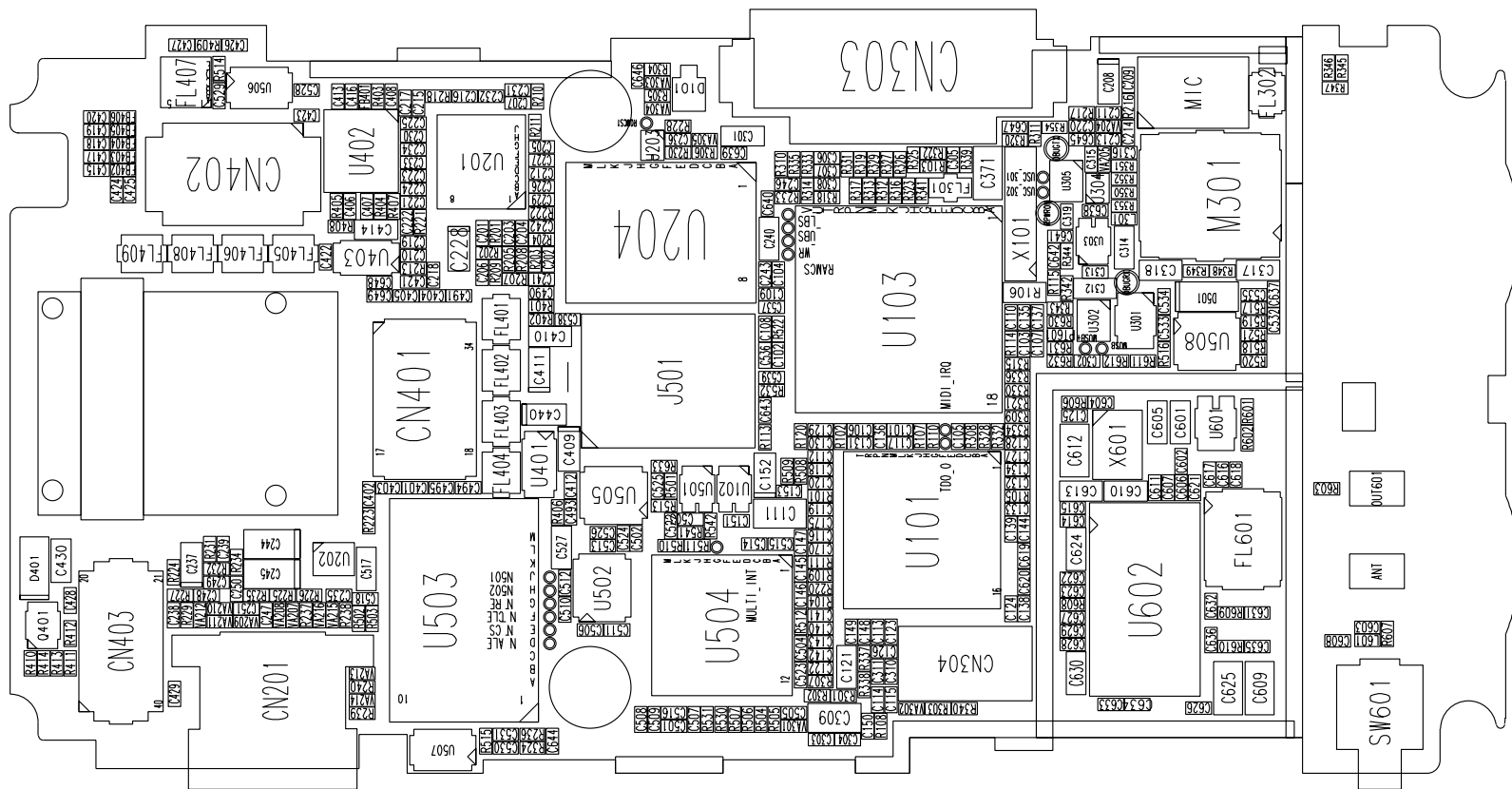


8. PCB LAYOUT



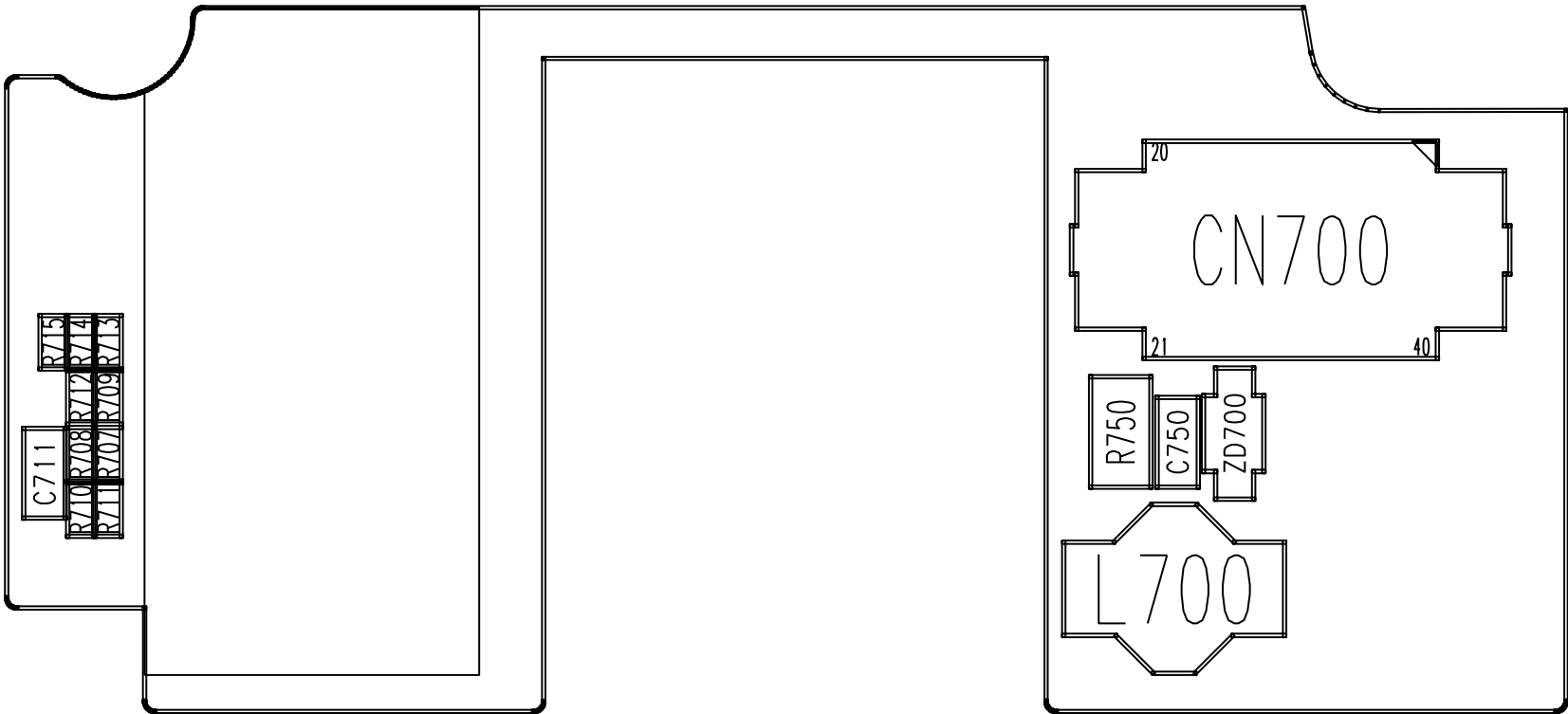
P7200-SPFY0110601-1.1-TOP

## 8. PCB LAYOUT



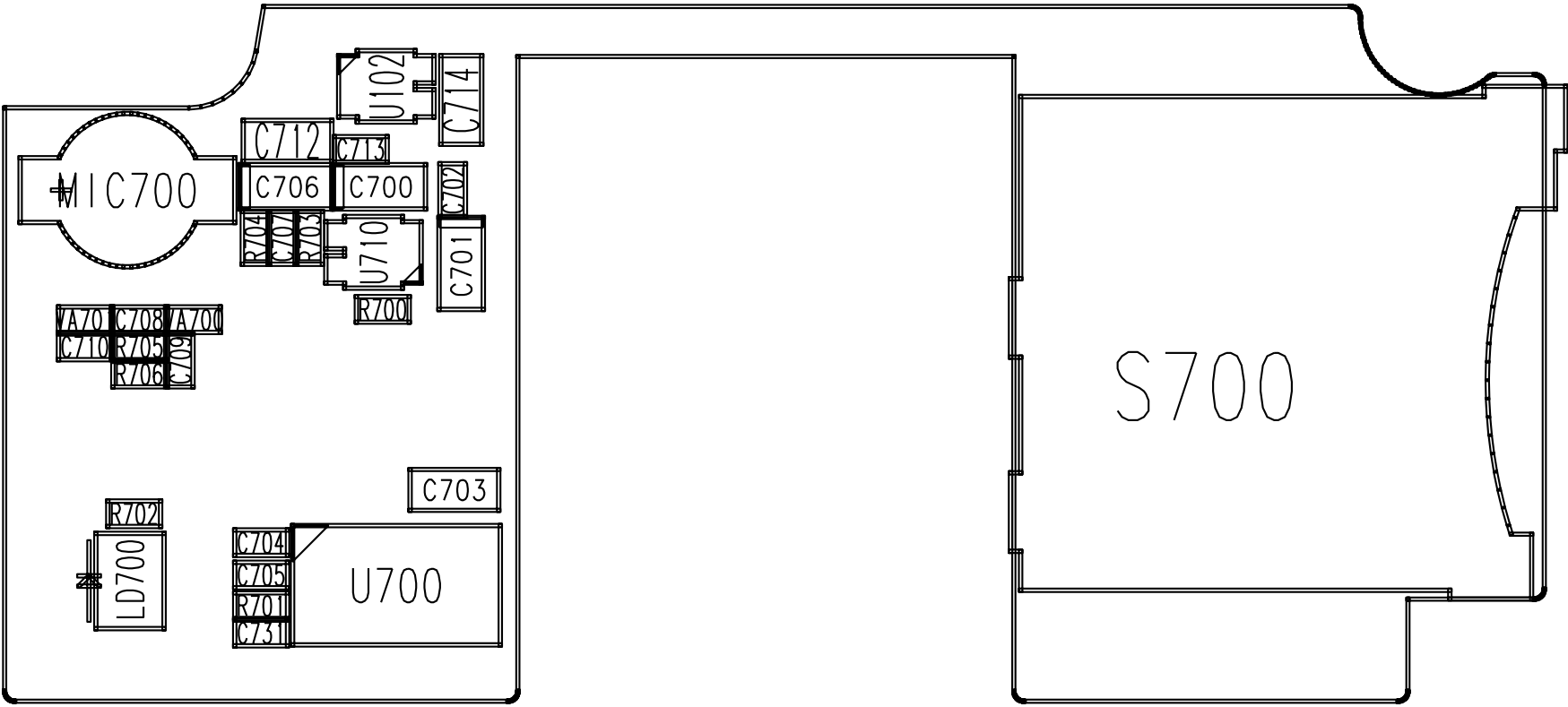
P7200-SPFY0110601-1.1-BTM

8. PCB LAYOUT



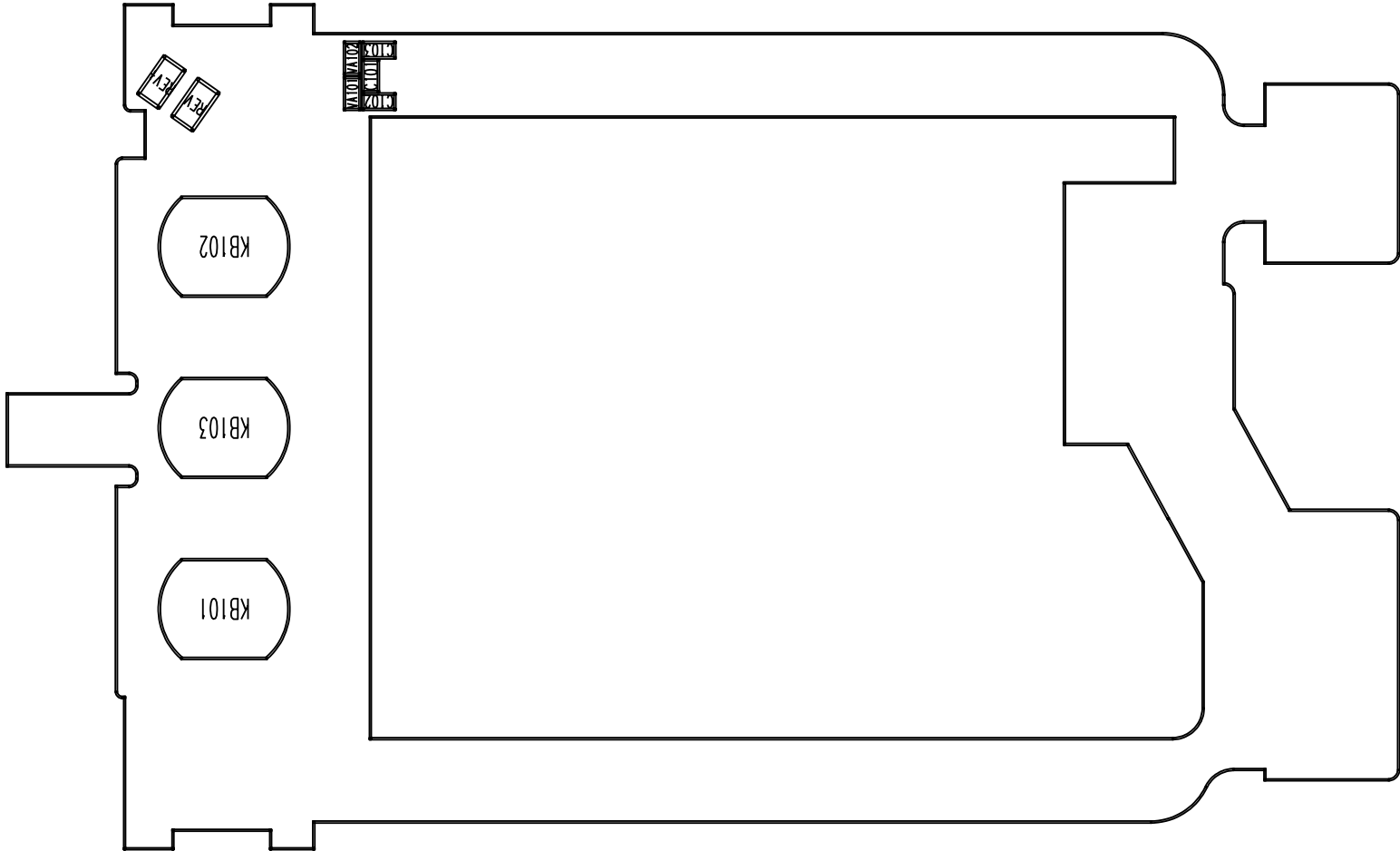
P7200-SPJY0020401-1.1-T0P

8. PCB LAYOUT



P7200-SPJY0020401-1.1-BTM

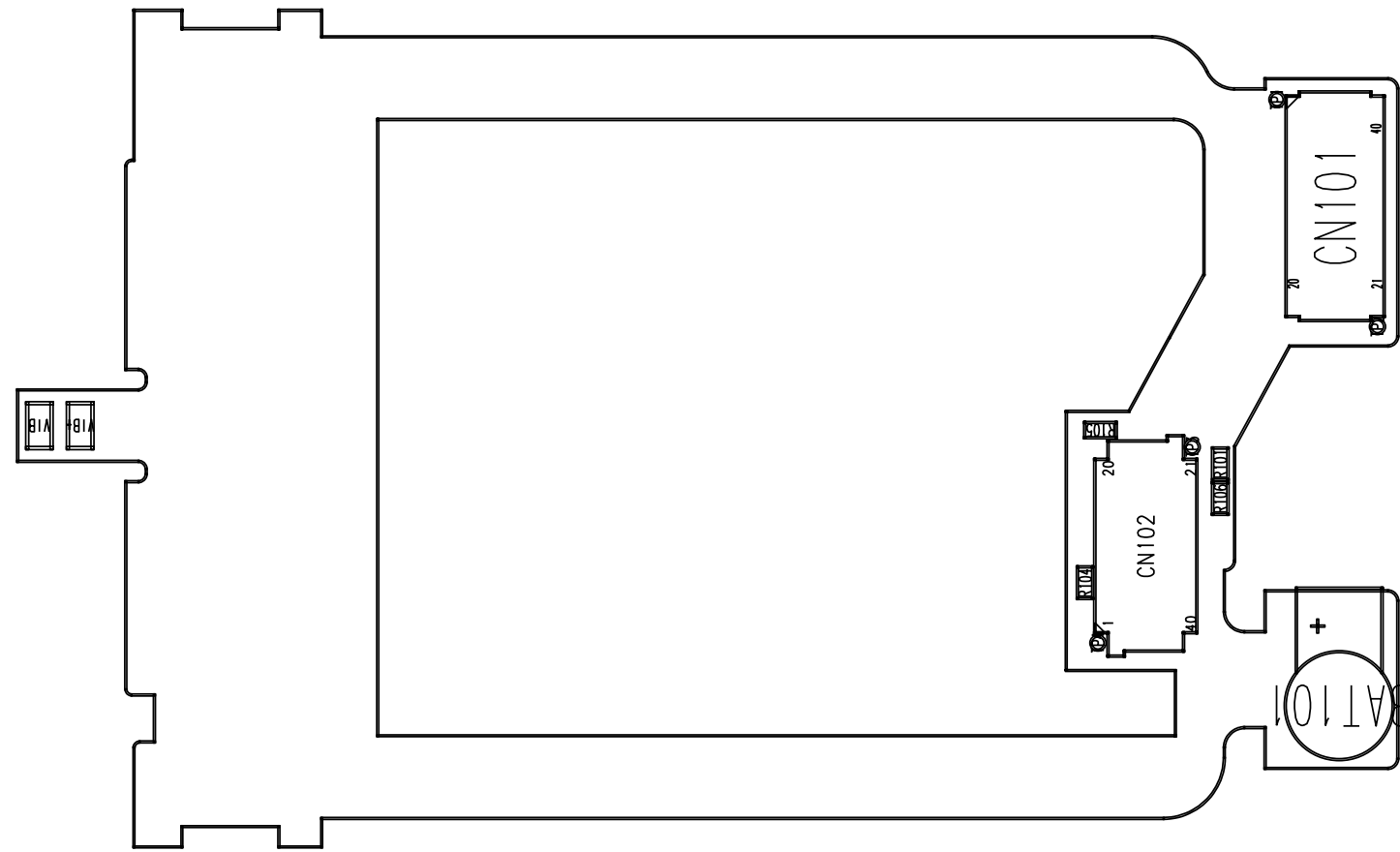
8. PCB LAYOUT



P7200-SPCY0061601-1 . 1 -T0P



## 8. PCB LAYOUT



P7200-SPCY0061601-1.1-BTM

## 9. ENGINEERING MODE

### A. About Engineering Mode

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset.

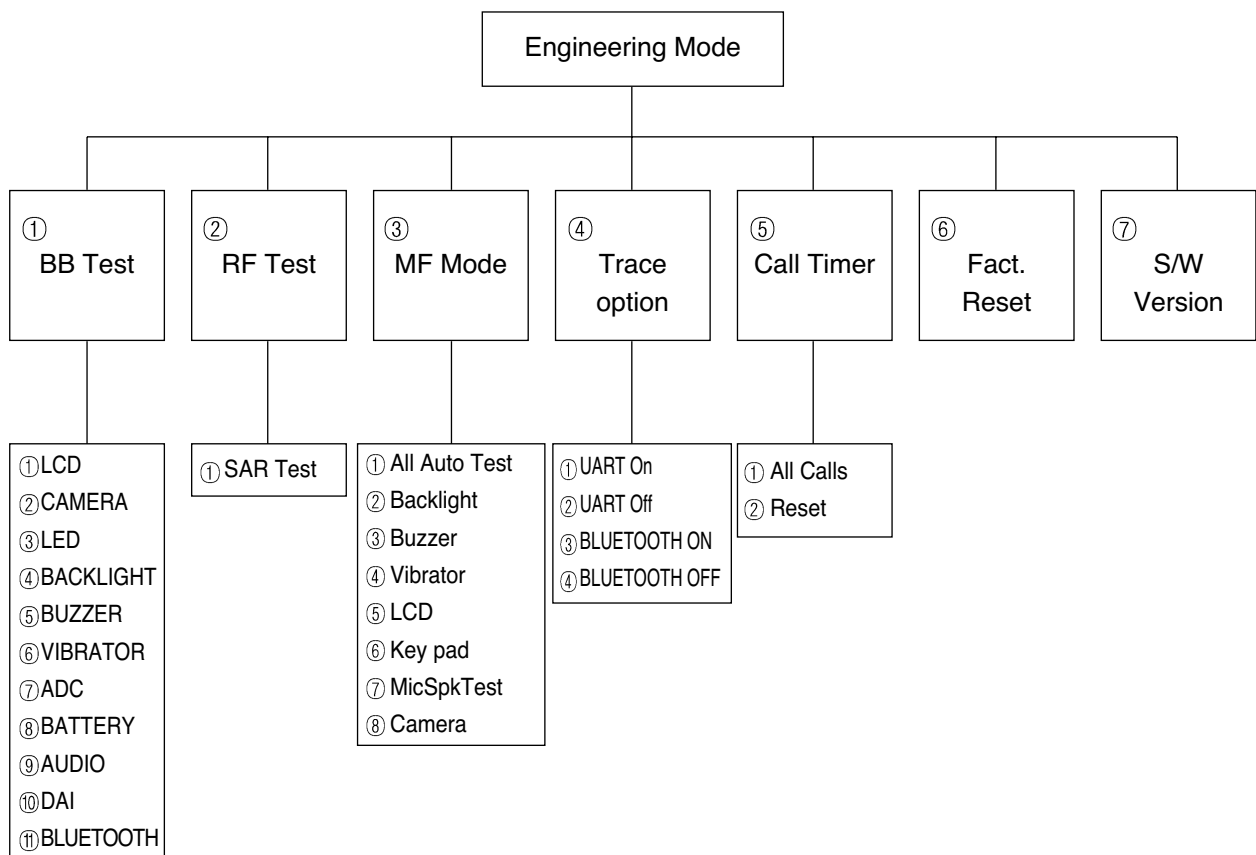
### B. Access Codes

The key sequence for switching the engineering mode on is 2945##. Pressing END will switch back to non-engineering mode operation.

### C. Key Operation

Use Up and Down key to select a menu and press 'select' key to progress the test. Pressing 'back' key will switch back to the original test menu.

### D. Engineering Mode Menu Tree



## 9. ENGINEERING MODE

---

### 9.1 BB Test [MENU 1]

#### 9.1.1 LCD

- 1) COLOUR : WHITE, RED, GREEN, BLUE, BLACK

#### 9.1.2 CAMERA

This menu is to test the Camera.

- 1) Main LCD preview : It shows the picture on Main LCD.
- 2) Sub LCD preview : It shows the picture on Sub LCD.
- 3) Flash on : It turns on the Flash LED.
- 4) Flash off : It turns off the Flash LED.

#### 9.1.3 LED

This menu is to test the LED.

- 1) Green On
- 2) Green Off
- 3) Red On
- 4) Red Off

#### 9.1.4 Backlight

This menu is to test the LCD Backlight and Keypad EL Backlight.

- 1) Backlight on : LCD Backlight and Keypad EL Backlight light on at the same time.
- 2) Backlight off : LCD Backlight and Keypad EL Backlight light off at the same time.
- 3) Backlight value : This controls brightness of Backlight. When entering into the menu, the present backlight-value in the phone is displayed. Use Left/Right key to adjust the level of brightness. The value of the brightness set at last will be saved in the NVRAM.

#### 9.1.5 Buzzer

This menu is to test the melody sound.

- 1) Melody on : Melody sound is played through the speaker.
- 2) Melody off : Melody sound is off.

#### 9.1.6 Vibrator

This menu is to test the vibration mode.

- 1) Vibrator on : Vibration mode is on.
- 2) Vibrator off : Vibration mode is off.

### 9.1.7 ADC (Analog to Digital Converter)

This displays the value of each ADC.

- 1) MVBAT ADC : Main Voltage Battery ADC
- 2) AUX ADC : Auxiliary ADC
- 3) TEMPER ADC : Temperature ADC

### 9.1.8 BATTERY

- 1) Bat Cal : This displays the value of Battery Calibration. The following menus are displayed in order :  
BAT\_LEV\_4V, BAT\_LEV\_3\_LIMIT, BAT\_LEV\_2\_LIMIT, BAT\_LEV\_1\_LIMIT,  
BAT\_IDLE\_LIMIT, BAT\_INCALL\_LIMIT, SHUT\_DOWN\_VOLTAGE,  
BAT\_RECHARGE\_LMT
- 2) TEMP Cal : This displays the value of Temperature Calibration. The following menus are displayed  
in order : TEMP\_HIGH\_LIMIT, TEMP\_HIGH\_RECHARGE\_LMT,  
TEMP\_LOW\_RECHARGE\_LMT, TEMP\_LOW\_LIMIT

### 9.1.9 Audio

This is a menu for setting the control register of Voiceband Baseband Codec chip.

Although the actual value can be written over, it returns to default value after switching off and on the phone.

- 1) VbControl1 : VbControl1 bit Register Value Setting
- 2) VbControl2 : VbControl2 bit Register Value Setting
- 3) VbControl3 : VbControl3 bit Register Value Setting
- 4) VbControl4 : VbControl4 bit Register Value Setting
- 5) VbControl5 : VbControl5 bit Register Value Setting
- 6) VbControl6 : VbControl6 bit Register Value Setting

### 9.1.0 DAI (Digital Audio Interface)

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- 1) DAI AUDIO : DAI audio mode
- 2) DAI UPLINK : Speech encoder test
- 3) DAI DOWNLINK : Speech decoder test
- 4) DAI OFF : DAI mode off

### 9.1.11 Bluetooth

This menu is to test Bluetooth.

- 1) Enter test mode
- 2) Bypass mode On
- 3) Bypass mode Off

## 9. ENGINEERING MODE

---

### 9.2 RF Test [MENU 2]

#### 9.2.1 SAR test

This menu is to test the Specific Absorption Rate.

- 1) SAR test on : Phone continuously process TX only. Call-setup equipment is not required.
- 2) SAR test off : TX process off

### 9.3 MF mode [MENU 3]

This manufacturing mode is designed to do the baseband test automatically. Selecting this menu will process the test automatically, and phone displays the previous menu after completing the test.

#### 9.3.1 All auto test

LCD, Backlight, Vibrator, Buzzer, Key Pad, Mic&Speaker,

#### 9.3.2 Backlight

LCD Backlight is on for about 1.5 seconds at the same time, then off.

#### 9.3.3 Buzzer

This menu is to test the volume of Melody. It rings in the following sequence. Volume 1, Volume 2, Volume 3, Volume 0 (mute), Volume 4, Volume 5.

#### 9.3.4 Vibrator

Vibrator is on for about 1.5 seconds.

#### 9.3.5 LCD

1)LCD

Main LCD screen resolution tests horizontally and vertically one by one and fills the screen.

#### 9.3.6 Key pad

When a pop-up message shows 'Press Any Key', you may press any keys including side keys, but not [Soft2 Key]. If the key is working properly, name of the key is displayed on the screen. Test will be completed in 15 seconds automatically.

### 9.3.7 MicSpk Test

The sound from MIC is recorded for about 3 seconds, then it is replayed on the speaker automatically.

### 9.4 Trace option [MENU 4]

This is NOT a necessary menu to be used by neither engineers nor users.

### 9.5 Call timer [MENU 5]

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- 1) All calls : This displays total conversation time. User cannot reset this value.
- 2) Reset settings : This resets total conversation time to this, [00:00:00].
- 3) DAI DOWNLINK : Speech decoder test
- 4) DAI OFF : DAI mode off

### 9.6 Fact. Reset [MENU 6]

This Factory Reset menu is to format data block in the flash memory and this procedure set up the default value in data block.

#### Attention

- ① Fact. Reset (i.e.Factory Reset) should be only used during the Manufacturing process.
- ② Servicemen should NOT progress this menu, otherwise some of valuable data such as Setting value, RF Calibration data, etc. cannot be restored again.

### 9.7 S/W version

This displays software version stored in the phone.

## 10. STAND ALONE TEST

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## 10. STAND ALONE TEST

### 10.1 Introduction

This manual explains how to examine the status of RX and TX of the model.

#### A. Tx Test

TX test - this is to see if the transmitter of the phones is activating normally.

#### B. Rx Test

RX test - this is to see if the receiver of the phones is activating normally.

### 10.2 Setting Method

#### A. COM port

- a. Move your mouse on the "Connect" button, then click the right button of the mouse and select "Com setting".
- b. In the "Dialog Menu", select the values as explained below.
  - Port : select a correct COM port
  - Baud rate : 38400
  - Leave the rest as default values

#### B. Tx

##### 1. Selecting Channel

- Select one of GSM or DCS Band and input appropriate channel.

##### 2. Selecting APC

- a. Select either Power level or Scaling Factor.
- b. Power level
  - Input appropriate value GSM (between 5~19) or DCS (between 0~15)
- c. Scaling Factor
  - A 'Ramp Factor' appears on the screen.
  - You may adjust the shape of the Ramp or directly input the values.

#### C. Rx

##### 1. Selecting Channel

- Select one of GSM or DCS Band and input appropriate channel.

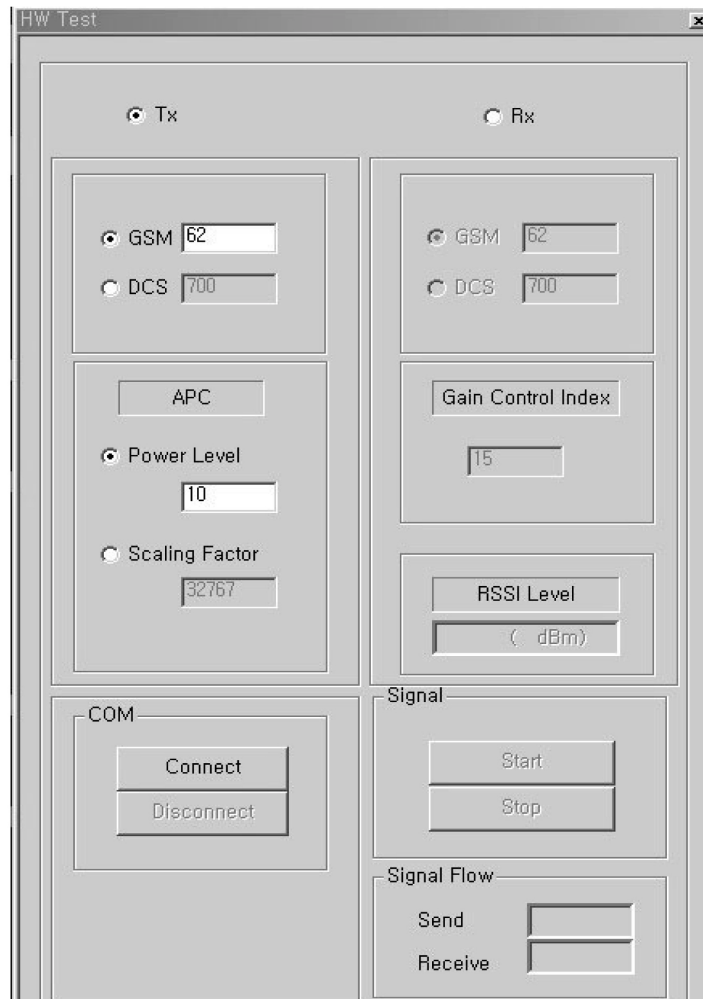
##### 2. Gain Control Index (0~ 26) and RSSI level

- See if the value of RSSI is close to -16dBm when setting the value between 0 ~ 26 in Gain Control Index.
- Normal phone should indicate the value of RSSI close to -16dBm.

### 10.3 Means of Test

- Select a COM port
- Set the values in Tx or Rx
- Select band and channel
- After setting them all above, press connect button.
- Press the start button

**Figure 10-1. HW test program**





# 10. STAND ALONE TEST

Figure 10-2. HW test setting

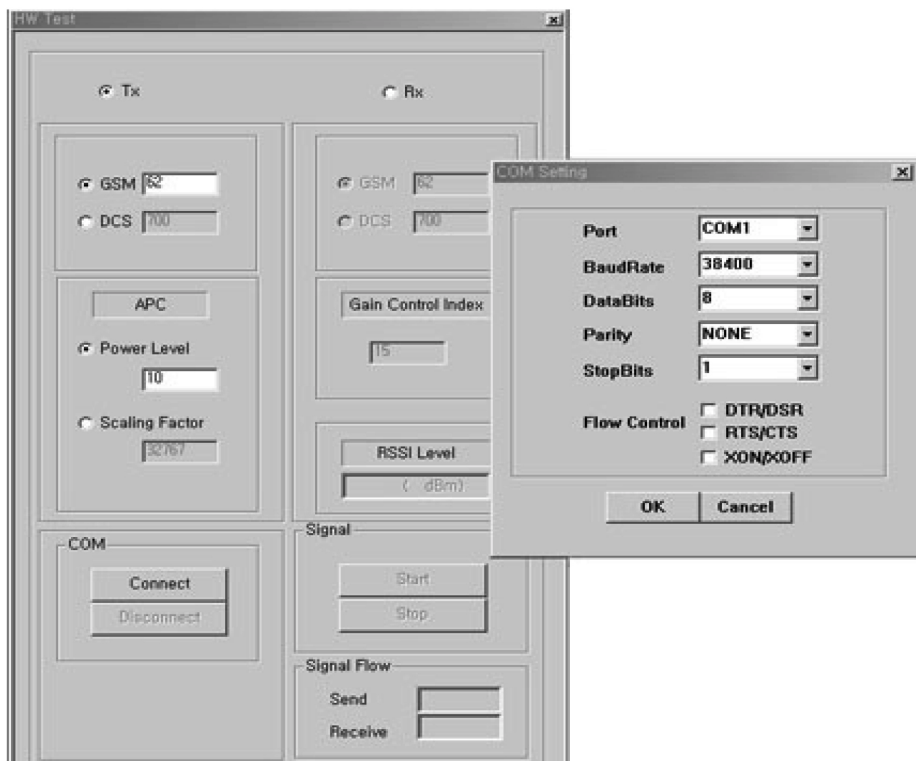
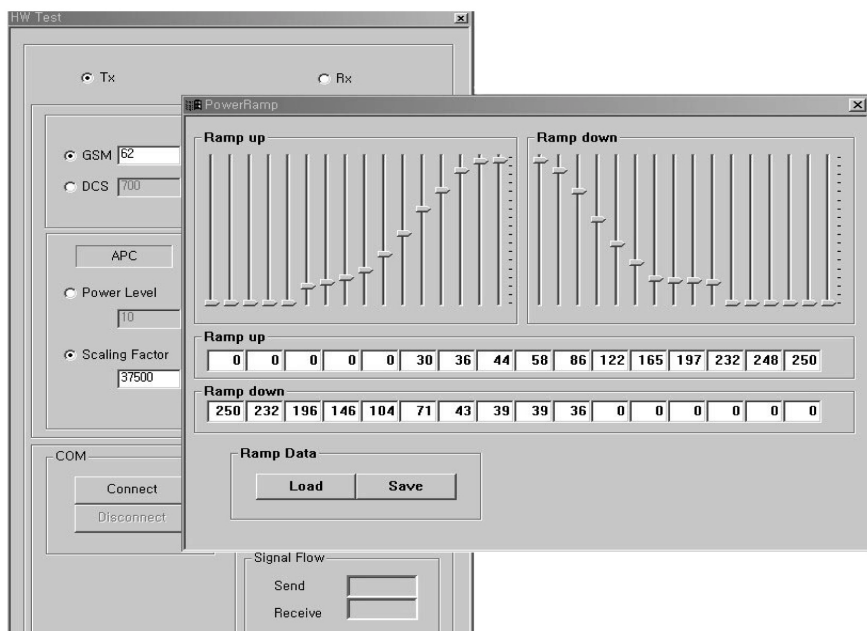


Figure 10-3. Ramping profile



# 11. AUTO CALIBRATION

## 11.1 Overview

Autocal (Auto Calibration) is the PC side Calibration tool that perform Tx ,Rx and Battery Calibration with Agilent 8960(GSM call setting instrument) and Tektronix PS2521G(Programmable Power supply). Autocal generate calibration data by communicating with phone and measuring equipment then write it into calibration data block of flash memory in GSM phone.

## 11.2 Requirements

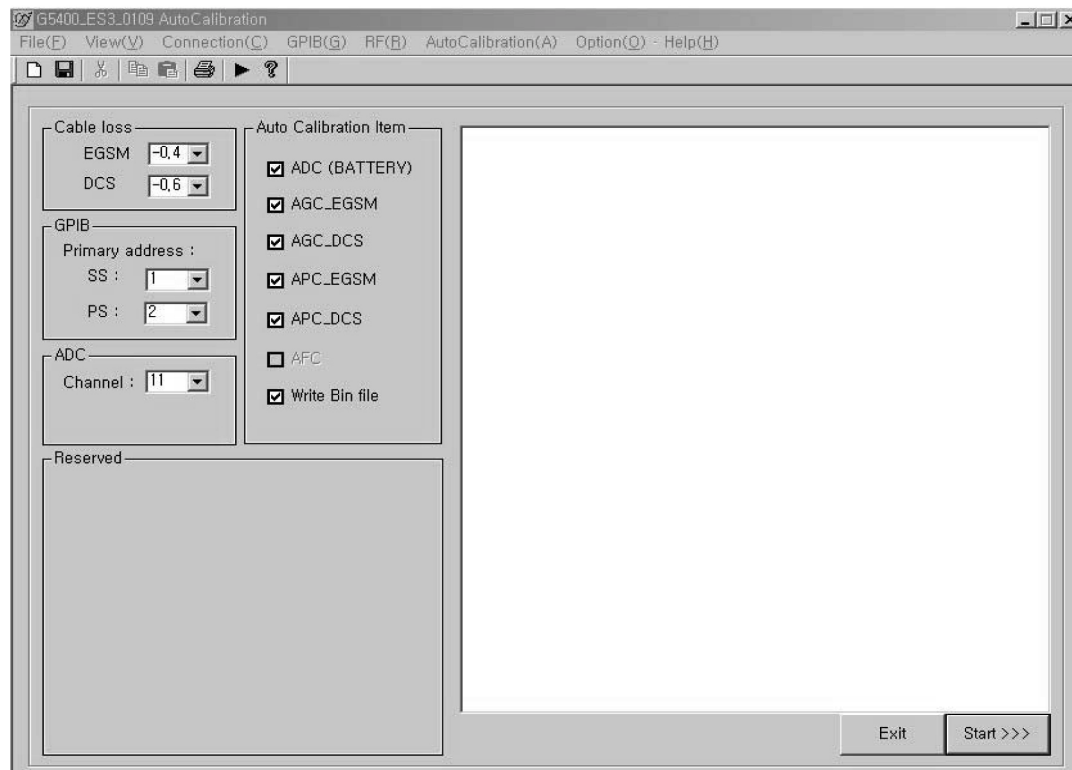
- PC or Notebook installed with Microsoft Windows 98/ME/2000/XP
- Auto Calibration program(Autocal.exe)
- GSM Phone
- LGE PIF JIG, Serial Cable, Data Cable
- Agilent 8960(Call Setting Instrument)
- Tektronix PS2521G(Programmable Power Supply)

## 11.3 Menu and Settings

- File(F) Clear View : Clear Calibration Status window texts
- File(F) Save View : Save Calibration Status window texts
- File(F) Save Setting : Save Current Calibration settings to setting file(\*.cal)
- File(F) Load Setting : Load saved Calibration setting
- File(F) Make BIN ALL : Make binary file after calibration finished
- File(F) Make BIN BAT.Cal only : Make binary file of battery cal data only after calibration finished
- File(F) Make & Write BIN : Make binary file after calibration finished then download it to the Flash Memory
- View(V) Tools : Enable or disable Tool bar
- View(V) Status : Enable or disable status bar
- Connection(C) Connect : Connect the phone with PC. This procedure checks whether the PC is connected "ag8960" or not. After that it performs sync. procedure with phone. If the sync. procedure is successful state column on status bar changed to SETUP, else you should disconnect phone and try again from the beginning and also check the whole connection. All measurement is performed at state SETUP.
- Connection(C) Port Setting : Show COM port setting dialog and Baudrate you can change,etc.
- GPIB(G) Connect : Connect the Ag8960 GPIB card with PC.

## 11. AUTO CALIBRATION

---



**Figure 11-1. Auto Calibration Program**

Screen → Cable loss : Enter the RF cable loss GSM and DCS

Screen → GPIB(Primary address) : Enter the SS(Ag8960) and PS(Tektronix PS2521G) GPIB address

Screen → ADC Channel : Default ADC Calibration Channel

Screen → Auto Calibration Item : Default Calibration Settings about Tx, Rx, ADC and write BIN file

### 11.4 AGC

This procedure is for Rx calibration.

In this procedure, We can get RSSI correction value. Set band EGSM and press Start button the result window will show correction values per every power level and gain code and the same measure is performed per every frequency.

### 11.5 APC

This procedure is for Tx calibration.

In this procedure you can get proper scale factor value and measured power level.

### 11.6 ADC

This procedure is for battery calibration.

You can get main Battery Config Table and temperature Config Table

### 11.7 Setting

check com port and cable loss. Select automatic calibration item. If you uncheck one item calibration will stop from the unchecked item. This is useful when you want to process only one item.

### 11.8 How to do calibration

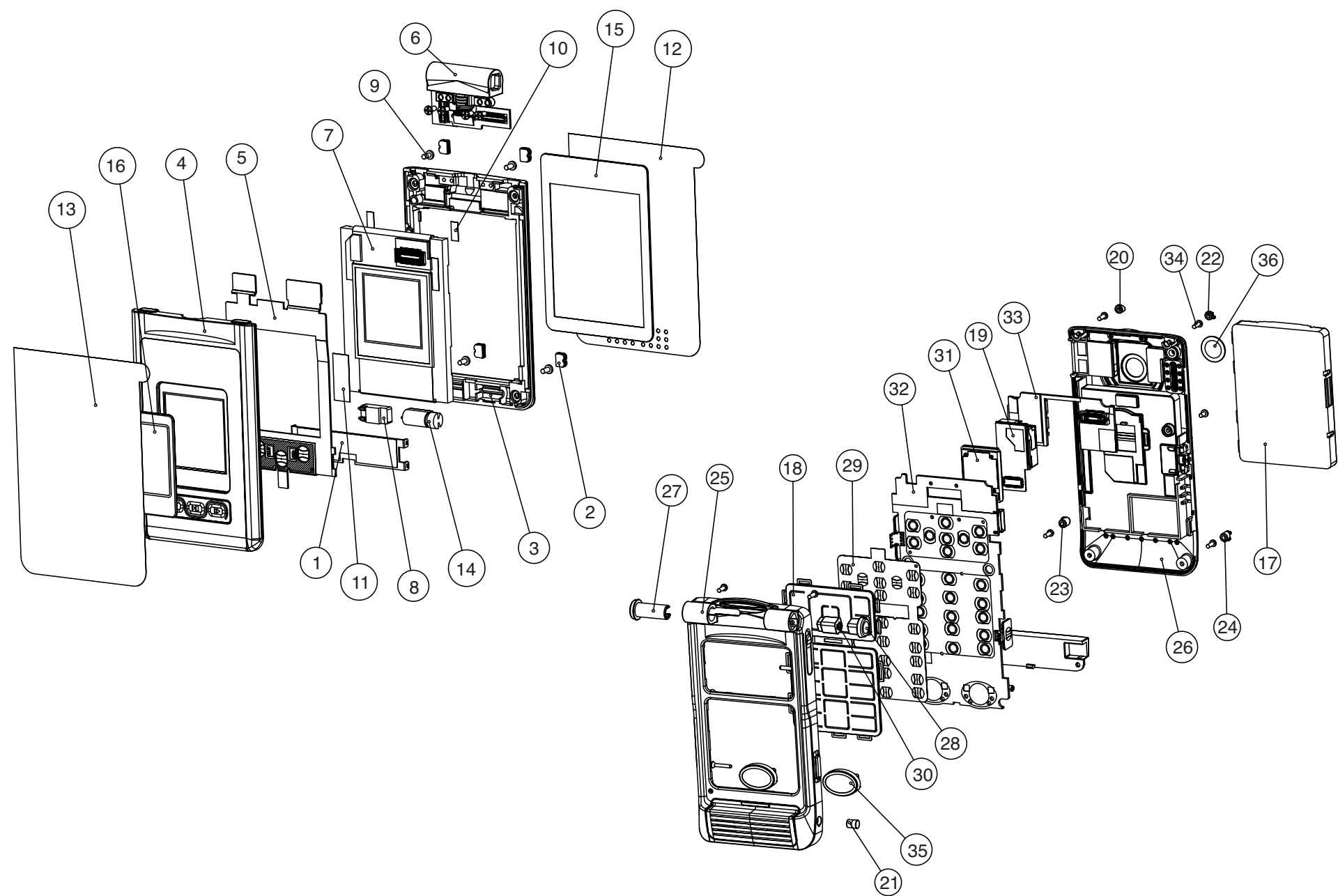
- A. Connect cable between phone and serial port of PC.
- B. Connect Ag8960 equipment and Power Supply and phone.
- C. Set correct port and baud rate.
- D. Press Start button. AutoCal process all calibration procedure
  - i. AGC EGSM
  - ii. AGC DCS
  - iii. APC EGSM
  - iv. APC DCS
  - v. ADC
- E. After finished all measurement. The state is return to SETUP.
- F. The Cal file will be generated and then the calibration data will be written into phone and then will be reset.

## Note

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12. EXPLODED VIEW & REPLACEMENT PART LIST

12.1 EXPLODED VIEW



36	WINDOW, CAMERA	MWAE0008101-MP	1
35	SPEAKER	XXXXXXXX-MP	2
34	SCREW_MACHINE	GMZZ0017601-MP	8
33	PCB, SUB	SPJY0020401-MP	1
32	PCB, MAIN	SPFY0110601-MP	1
31	HOLDER, ASSY	AHCZ0001501-MP	1
30	HINGE, FOLDER	MHFD0009801-MP	1
29	DOME ASSY, METAL	ADCA0032401-MP	1
28	DECO, HINGE	MDAJ0008401-MP	1
27	DECO, HINGE	MDAJ0008301-MP	1
26	COVER ASSY, REAR	ACGM0050601-MP	1
25	COVER ASSY, FRONT	ACGK0050901-MP	1
24	CAP, SCREW	MCCH0053601-MP	1
23	CAP, SCREW	MCCH0053401-MP	1
22	CAP, SCREW	MCCH0053201-MP	1
21	CAP, MOBILE SWITCH	MCCF0024101-MP	1
20	CAP, SCREW	MCCH0053301-MP	1
19	CAMERA_MODULE	XXXXXXXXXXXX-MP	1
18	BUTTON, DIAL	MBJA0016501-MP	1
17	BATTERY, PACK LI-POLYMER	SBPP0013301-MP	1
16	WINDOW, LCD(SUB)	MWAF0026701-MP	1
15	WINDOW ASSY, LCD	AWAB0017201-MP	1
14	VIBRATOR	SJMY0007003-MP	1
13	TAPE, PROTECTION	MTAB0077802-MP	1
12	TAPE, PROTECTION	MTAB0077801-MP	1
11	TAPE	MTAZ0079901-MP	1
10	TAPE	MTAZ0069001-MP	2
9	SCREW_MACHINE	GMZZ0015101-MP	8
8	RECEIVER	XXXXXXXXXXXX-MP	1
7	LCD	SVLY0026501-MP	1
6	HINGE ASSY, FOLDER	AHFA0001701-MP	1
5	FPCB LCD, ASSY	XXXXXXXXXXXX-MP	1
4	COVER ASSY, FOLDER(UPPER)	ACGJ0044101-MP	1
3	COVER ASSY, FOLDER(LOWER)	ACGH0032501-MP	1
2	CAP, ASSY	ACAZ0004201-MP	4
1	BRACKET, ASSY	ABFZ0004701-MP	1
ITEM	PART NAME	PART No.	Q'TY



## 12. EXPLODED VIEW & REPLACEMENT PART LIST

### 12.2 Replacement Parts <Mechanic component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
1		GSM(FOLDER)	TGFF0083507		Black	
2	AAAY00	ADDITION	AAAY0128505		Black	
2	APEY00	PHONE	APEY0253007		Black	
3	ACGG00	COVER ASSY,FOLDER	ACGG0057601	G912	Black	
4	ABFZ00	BRACKET ASSY	ABFZ0004701	G912 BRACKET MUSIC ATTACH TAPE	Silver	1
5	MBFZ00	BRACKET	MBFZ0021501	G912 MUSIC KEY HOLDEER	Silver	
5	MTAZ00	TAPE	MTAZ0068901	G912 TAPE (BRACKET,MOD)	Transparent	
4	ACAZ00	CAP ASSY	ACAZ0004201	G912 CAP SCREW(FOLDER)	Black	2
5	MCCH00	CAP,SCREW	MCCH0050201	G912 FOLDER	Black	
5	MTAZ00	TAPE	MTAZ0080101	G912 TAPE(CAP,SCREW)	Without Color	
4	ACGH00	COVER ASSY, FOLDER(LOWER)	ACGH0032501	G912	Black	3
5	MCJH00	COVER,FOLDER(LOWER)	MCJH0025801	G912	Black	
5	MGAD00	GASKET,SHIELD FORM	MGAD0082201	G912 GASKET,SHIELD FORM(CONNECTOR)	Gold	
5	MMAA00	MAGNET,SWITCH	MMAA0003201	F2100 magnet switch	Without Color	
5	MPBZ00	PAD	MPBZ0084901	G912 PAD	Black	
4	ACGJ00	COVER ASSY, FOLDER(UPPER)	ACGJ0044101	G912	Black	4
5	MBHY00	BUMPER	MBHY0014201	G912 FOLDER BUMPER	Black	
5	MBJZ00	BUTTON	MBJZ0004501	G912 BUTTON (MUSIC KEY)	Black	
5	MCJJ00	COVER,FOLDER(UPPER)	MCJJ0032801	G912	Black	
5	MDAE00	DECO,FOLDER(UPPER)	MDAE0029201	G912	Black	
5	MGAD00	GASKET,SHIELD FORM	MGAD0082101	G912 GASKET,SHIELD FORM (FPCB)	Gold	
5	MGAD01	GASKET,SHIELD FORM	MGAD0082201	G912 GASKET,SHIELD FORM(CONNECTOR)	Gold	
5	MGAD02	GASKET,SHIELD FORM	MGAD0086501	G912 GASKET,SHIELD FORM	Gold	
5	MGAD03	GASKET,SHIELD FORM	MGAD0095601		Gold	
5	MPBM00	PAD,RECEIVER	MPBM0009501	G912 PAD RECEIVER	Black	
5	MPBQ00	PAD,LCD(SUB)	MPBQ0021801	G912	Black	
5	MPBZ00	PAD	MPBZ0084801	G912 PAD VIB	Black	
5	MTAA00	TAPE,DECO	MTAA0077901	G912 TAPE,DECO (TAPE UPPER DECO)	Without Color	
5	MTAE00	TAPE,WINDOW(SUB)	MTAE0022101	G912	Transparent	



## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	MTAZ00	TAPE	MTAZ0074801	G912 CONDUCTIVE TAPE	Black	
5	MTAZ01	TAPE	MTAZ0085501	P7200 TAPE MOD_1	Black	
5	MTAZ02	TAPE	MTAZ0085502	P7200 TAPE MOD (LEFT)	Black	
4	ACGK00	COVER ASSY,FRONT	ACGK0050901	G912	Black	25
5	MBHY00	BUMPER	MBHY0013301	G912 BUMPER	Metal Silver	
5	MBJL00	BUTTON,SIDE	MBJL0020401	G912	Silver	
5	MBJP00	BUTTON,SHUTTER	MBJP0002201	G912	Silver	
5	MCCC00	CAP,EARPHONE JACK	MCCC0023701	G912	Black	
5	MCCZ00	CAP	MCCZ0011901	G912 CAP (IO CONNECTOR)	Black	
5	MCCZ01	CAP	MCCZ0012001	G912 CAP(T-FLASH)	Black	
5	MCJK00	COVER,FRONT	MCJK0038601	G912	Black	
5	MDAG00	DECO,FRONT	MDAG0011001	G912	Metal Silver	
5	MDAN00	DECO,SPEAKER	MDAN0005501	G912	Black	
5	MFBC00	FILTER,SPEAKER	MFBC0015501	G912 FILTER SPEAKER	Without Color	
5	MFBD00	FILTER,MIKE	MFBD0010901	G912 FILTER,MIKE	Without Color	
5	MPBN00	PAD,SPEAKER	MPBN0019701	G912	Black	
5	MSGY00	STOPPER	MSGY0010901	G912 STOP FOLDER	Black	
5	MTAB00	TAPE,PROTECTION	MTAB0088501	PROTECTION(DECO,SPEAKER)	Blue	
5	MTAZ00	TAPE	MTAZ0068801	G912 TAPE BUMPER (3M 9731 0.15T)	Transparent	
5	MTAZ01	TAPE	MTAZ0068802	G912 TAPE STOPER (3M 9731 0.15T)	Transparent	
5	MTAZ02	TAPE	MTAZ0036001	C1300 CGRSV 27 X 9 X 0.05t	Blue	
4	AWAB00	WINDOW ASSY,LCD	AWAB0017201	G912 ATTACH (PAD,TAPE)	Without Color	15
5	MTAD00	TAPE,WINDOW	MTAD0036701	G912 TAPE WINDOW	Transparent	
5	MTAZ00	TAPE	MTAZ0097401	TAPE,WINDOW(PAD)	Transparent	
5	MWAC00	WINDOW,LCD	MWAC0051501	G912	Silver	
4	GMZZ00	SCREW MACHINE	GMZZ0017501	1.4 mm,3.5 mm,MSWR3 ,N ,+ , - ,NYLOK,HEAD PIE2.5	Silver	34
4	GMZZ01	SCREW MACHINE	GMZZ0018401	1.4 mm,30 mm,MSWR3(BK) ,N ,+ , - ,NYLOK,HEAD PIE2.5	Black	34
4	MDAJ00	DECO,HINGE	MDAJ0008301	G912	Silver	27
4	MDAJ01	DECO,HINGE	MDAJ0008401	G912	Silver	28
4	MGAD00	GASKET,SHIELD FORM	MGAD0088501	G912 ATTACH MCC	Gold	
4	MHFD00	HINGE,FOLDER	MHFD0009801	G912 HINGE FOLDER (CLICK)	Without Color	30
4	MLAC00	LABEL,BARCODE	MLAC0003401	EZ LOOKS(user for mechanical)	Without Color	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
4	MTAB00	TAPE,PROTECTION	MTAB0077801	P7200 FOLDER (MAIN),ENGLISH	Blue	12
4	MTAB01	TAPE,PROTECTION	MTAB0077802	G912 FOLDER(SUB)	Blue	13
4	MTAZ00	TAPE	MTAZ0069001	G912 LCD GROUND	Transparent	10
4	MTAZ01	TAPE	MTAZ0079901	G912 TAPE (PE FILM)	Blue	11
4	MWAF00	WINDOW,LCD(SUB)	MWAF0026701	G912	Silver	16
5	GMEY00	SCREW MACHINE,BIND	GMEY0009201	1.4 mm,3.5 mm,MSWR3(BK) ,B ,+ ,HEAD D=2.7mm	Black	
5	MCCH00	CAP,SCREW	MCCH0051901	G912 CAP,SCREW(HINGE,SWIVEL)	Black	
5	MCJU00	COVER,HINGE(UPPER)	MCJU0002101	G912 COVER,HINGE(SWIVEL)	Black	
5	MHFD00	HINGE,FOLDER	MHFD0009701	G912 HINGE (SWIVEL)	Without Color	
3	ACGM00	COVER ASSY,REAR	ACGM0050601	G912	Black	26
4	MBGY00	BUFFER	MBGY0002001	PC SHEET	Black	
4	MCJN00	COVER,REAR	MCJN0034801	G912	Metal Silver	
4	MDAD00	DECO,CAMERA	MDAD0011601	G912	Silver	
4	MDAK00	DECO,REAR	MDAK0006401	G912	Black	
4	MFBD00	FILTER,MIKE	MFBD0010902	G912 ATTACHED REAR	Without Color	
4	MGAD00	GASKET,SHIELD FORM	MGAD0085901	G912 (REAR,IO)	Gold	
4	MGAD01	GASKET,SHIELD FORM	MGAD0088901	G912 (REAR, CAMERA)	Gold	
4	MGAD02	GASKET,SHIELD FORM	MGAD0091701	GASKET,SHIELD FORM SUB PCB	Gold	
4	MLCE00	LENS,FLASH	MLCE0004101	G912 LENS,FLASH	Silver	
4	MLEA00	LOCKER,BATTERY	MLEA0023001	G912	Metal Silver	
4	MLEY00	LOCKER	MLEY0000801	SIM LOCKER	Silver	
4	MPBT00	PAD,CAMERA	MPBT0015601	G912 PAD,CAMERA	Black	
4	MPBZ00	PAD	MPBZ0084701	G912 PAD 1 (SUB PCB)	Black	
4	MPBZ01	PAD	MPBZ0109801	PAD_CAMERA_TOP	Black	
4	MPFZ00	PLATE	MPFZ0017901	G912	Black	
4	MPFZ01	PLATE	MPFZ0022601		Silver	
4	MSDB00	SPRING,COIL	MSDB0001702	L1400	Pearl White	
4	MSDD00	SPRING,PLATE	MSDD0005001	G912 BATTERY DETACH	Silver	
4	MTAA00	TAPE,DECO	MTAA0078001	G912 TAPE TBF 0.15T(DECO, CAMERA)	Yellow	
4	MTAB00	TAPE,PROTECTION	MTAB0083501	G912 ATTACH DECO,CAMERA	Blue	
4	MTAB01	TAPE,PROTECTION	MTAB0083601	G912 ATTACH IN WINDOW,CAMERA	Blue	
4	MTAZ00	TAPE	MTAZ0068701	G912 TAPE CAMER WINDOW	Transparent	
4	MWAE00	WINDOW,CAMERA	MWAE0008101	G912	Transparent	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
3	GMZZ00	SCREW MACHINE	GMZZ0017501	1.4 mm,3.5 mm,MSWR3 ,N ,+ , - ,NYLOK,HEAD PIE2.5	Silver	34
3	MBJA00	BUTTON,DIAL	MBJA0016504	ENGLISH	Silver	18
3	MCCF00	CAP,MOBILE SWITCH	MCCF0024101	G912	Black	21
3	MCCH00	CAP,SCREW	MCCH0053201	G912 REAR(UP,LEFT)	Silver	22
3	MCCH01	CAP,SCREW	MCCH0053301	G912 REAR(UP,RIGHT)	Silver	20
3	MCCH02	CAP,SCREW	MCCH0053401	G912 REAR(DOWN,LEFT)	Silver	23
3	MCCH03	CAP,SCREW	MCCH0053601	G912 REAR(DOWN,RIGHT)	Silver	24
3	MLAK00	LABEL,MODEL	MLAK0006901			
5	ADCA00	DOME ASSY,METAL	ADCA0032201	G912 ATTACH EL SHEET	Silver	29
5	AHCZ00	HOLDER ASSY	AHCZ0001501	G912 CAMERA HOLDER	Silver	31
6	MHGZ00	HOLDER	MHGZ0022101	G912 HOLDER(CAMERA)	Without Color	
6	MPBZ00	PAD	MPBZ0084601	G912 PAD CAMERA HOLDER	Black	
6	MTAZ00	TAPE	MTAZ0068601	G912 HOLDER ABOVE	Transparent	
6	MTAZ01	TAPE	MTAZ0068602	G912 HOLDER BELOW	Transparent	
5	MGAZ00	GASKET	MGAZ0022801	IO_FRONT	Gold	
5	MTAZ00	TAPE	MTAZ0079901	G912 TAPE (PE FILM)	Blue	
5	MLAB00	LABEL,A/S	MLAB0000601	HUMIDITY STICKER	Without Color	
5	MLAC00	LABEL,BARCODE	MLAC0003301	EZ LOOKS(use for PCB ASSY MAIN(hardware))	Without Color	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

### <Main component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
4	SACY00	PCB ASSY,FLEXIBLE	SACY0037501			
5	SACB00	PCB ASSY, FLEXIBLE,INSERT	SACB0024001			
6	SBCL00	BATTERY,CELL,LITHIUM	SBCL0001303	2 V,1 mAh,COIN ,SOLDER TYPE BACKUP BATTERY		
5	SACE00	PCB ASSY,FLEXIBLE,SMT	SACE0033301			
6	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0017701			
7	CN101	CONNECTOR,BOARD TO BOARD	ENBY0028501	40 PIN,0.4 mm,ETC , ,H=1.5, P4S Socket		
7	CN102	CONNECTOR,BOARD TO BOARD	ENBY0027407	40 PIN,0.4 mm,ETC ,AU ,H:1.0MM		
7	R104	RES,CHIP	ERHY0000201	0 ohm, 1/16W,J,1005,R/TP		
7	R105	RES,CHIP	ERHY0000201	0 ohm, 1/16W,J,1005,R/TP		
7	R106	RES,CHIP	ERHY0000201	0 ohm, 1/16W,J,1005,R/TP		
6	SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0025601			
7	C101	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
7	C102	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
7	C103	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
7	VA101	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
7	VA102	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
7	VA103	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	SPCY00	PCB,FLEXIBLE	SPCY0061601	POLYI ,0.4 mm,MULTI-4 ,P7200		
4	SJMY00	VIBRATOR,MOTOR	SJMY0007003	3 V,0.08 A,4*8L ,Cylinder, Wire 15mm		14
4	SURY00	RECEIVER	SURY0010401	ASSY ,102 dB,32 ohm,09*06 ,3.0T		
4	SUSY00	SPEAKER	SUSY0017701	PIN ,8 ohm,86 dB,15 mm,*10, 3.4T		
4	SVLY00	LCD	SVLY0026501	MAIN ,176*220 (2.0")+ 96*96(1.17") ,39*52.2*4.0(T) ,262k ,TFT ,TM ,HD66784 ,4.0t slim size		7
4	SWWA00	WIRE ASSY	SWWA0058001	37 mm,40 LINE,42 ,Matsushita P4S		
3	SAFY00	PCB ASSY,MAIN	SAFY0145005			
4	SAFB00	PCB ASSY,MAIN,INSERT	SAFB0050201			
5	SNGF00	ANTENNA,GSM,FIXED	SNGF0009301	3.0 ,-2 dBd,- ,GSM900+DCS1800+DCS1900		
5	SPKY00	PCB,SIDEKEY	SPKY0022001	POLYI ,0.2 mm,DOUBLE ,VOLUME,P7200		
5	SPKY01	PCB,SIDEKEY	SPKY0022101	POLYI ,0.2 mm,DOUBLE ,Camera,P7200		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	SVCY00	CAMERA	SVCY0007901	CMOS ,MEGA ,2Mega AF		
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0069506			
5	SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0061901			
6	C101	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C102	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C103	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C104	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C105	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C106	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C107	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C108	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C109	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C110	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C111	CAP,CERAMIC,CHIP	ECCH0000393	22 uF,6.3V ,M ,X5R ,HD ,2012 ,R/TP		
6	C112	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C113	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C114	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C115	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C116	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C117	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C118	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C119	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C120	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C121	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C122	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C123	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C124	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C125	CAP,CERAMIC,CHIP	ECCH0000165	68 nF,6.3V,K,X5R,HD,1005,R/TP		
6	C126	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C127	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C128	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C129	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C130	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C131	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C132	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C133	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C134	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C136	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C138	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C139	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C140	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C141	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C142	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C143	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C144	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C145	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C146	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C147	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C148	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C149	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C150	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C151	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C152	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C153	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C170	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C175	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C201	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP		
6	C202	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP		
6	C203	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C204	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C205	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C206	CAP,CERAMIC,CHIP	ECCH0000159	22 nF,16V,K,X7R,HD,1005,R/TP		
6	C207	CAP,CERAMIC,CHIP	ECCH0000159	22 nF,16V,K,X7R,HD,1005,R/TP		
6	C208	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C209	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C210	CAP,CERAMIC,CHIP	ECCH0000139	470 pF,50V,K,X7R,HD,1005,R/TP		
6	C211	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C212	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C213	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C214	RES,CHIP	ERHY0000106	100 ohm,1/16W,F,1005,R/TP		
6	C215	CAP,CERAMIC,CHIP	ECCH0000139	470 pF,50V,K,X7R,HD,1005,R/TP		
6	C216	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C217	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C218	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C219	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C221	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	C222	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	C223	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C224	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C225	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C226	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C227	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C228	CAP,TANTAL,CHIP	ECTH0001903	22 uF,6.3V ,M ,L _ESR ,1608 ,R/TP		
6	C229	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C230	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C231	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C232	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C233	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C234	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C235	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C236	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C237	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L _ESR ,1608 ,R/TP		
6	C238	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C239	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C240	CAP,CERAMIC,CHIP	ECCH0000271	0.1 uF,16V,K,X7R,HD,1608,R/TP		
6	C241	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C242	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C243	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C244	CAP,TANTAL,CHIP	ECTH0004402	33 uF,6.3V ,M ,L _ESR ,2012 ,R/TP		
6	C245	CAP,TANTAL,CHIP	ECTH0004402	33 uF,6.3V ,M ,L _ESR ,2012 ,R/TP		
6	C246	CAP,CERAMIC,CHIP	ECCH0000133	220 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C247	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C248	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C249	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C250	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C251	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C301	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C302	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C303	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C304	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C305	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C306	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C307	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C308	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C309	CAP,CERAMIC,CHIP	ECCH0006501	10 uF,6.3V ,K ,X5R ,TC ,2012 ,R/TP		
6	C310	CAP,CERAMIC,CHIP	ECCH0000104	3 pF,50V,C,NP0,TC,1005,R/TP		
6	C311	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C312	CAP,CERAMIC,CHIP	ECCH0007801	4.7 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C313	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C314	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C315	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C317	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C318	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C319	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C371	CAP,CERAMIC,CHIP	ECCH0006501	10 uF,6.3V ,K ,X5R ,TC ,2012 ,R/TP		
6	C401	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C402	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C403	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C404	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C405	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C406	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C407	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C408	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C409	CAP,TANTAL,CHIP	ECTH0001901	10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP		
6	C410	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C411	CAP,TANTAL,CHIP	ECTH0004101	22 uF,6.3V ,M ,STD ,1608 ,R/TP		



## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C412	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C413	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C414	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C415	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C416	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C417	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C418	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C419	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C420	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C421	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C422	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C423	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C424	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C425	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C426	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C427	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C428	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C429	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C430	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C440	CAP,TANTAL,CHIP	ECTH0004101	22 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C501	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C502	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C503	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C504	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C505	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C506	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	C507	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C508	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C509	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C510	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C511	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C512	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C513	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C514	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C515	CAP,CERAMIC,CHIP	ECCH0000186	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C516	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C517	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C518	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C522	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C523	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C524	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C525	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C526	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C527	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C528	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	C529	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	C530	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	C531	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	C533	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C534	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C535	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C536	CAP,CERAMIC,CHIP	ECCH0004902	220 nF,10V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	C538	CAP,CERAMIC,CHIP	ECCH0000124	56 pF,50V,J,NP0,TC,1005,R/TP		
6	C539	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	C601	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C602	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C603	INDUCTOR,CHIP	ELCH0004715	27 nH,J ,1005 ,R/TP ,		
6	C604	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C605	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C606	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP		
6	C607	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C608	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C609	CAP,CERAMIC,CHIP	ECCH0000393	22 uF,6.3V ,M ,X5R ,HD ,2012 ,R/TP		
6	C610	CAP,CERAMIC,CHIP	ECCH0007801	4.7 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C611	CAP,CERAMIC,CHIP	ECCH0000186	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C612	CAP,CERAMIC,CHIP	ECCH0000393	22 uF,6.3V ,M ,X5R ,HD ,2012 ,R/TP		
6	C613	CAP,CERAMIC,CHIP	ECCH0007801	4.7 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C614	CAP,CERAMIC,CHIP	ECCH0000186	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C615	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C616	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C617	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C618	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C619	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C620	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C621	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C622	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C623	CAP,CERAMIC,CHIP	ECCH0000186	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C624	CAP,CERAMIC,CHIP	ECCH0007801	4.7 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C625	CAP,CERAMIC,CHIP	ECCH0000393	22 uF,6.3V ,M ,X5R ,HD ,2012 ,R/TP		
6	C626	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C628	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C629	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C630	CAP,CERAMIC,CHIP	ECCH0007801	4.7 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C633	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C634	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C635	CAP,CERAMIC,CHIP	ECCH0000173	1.2 pF,16V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C636	INDUCTOR,CHIP	ELCH0001402	18 nH,J ,1005 ,R/TP ,Pb Free		
6	C637	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C638	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C639	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C640	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C641	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C642	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C643	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C644	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C645	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C646	DIODE,TVS	EDTY0008501	TFSC ,5 V,50 W,R/TP ,small size		
6	C647	DIODE,TVS	EDTY0008501	TFSC ,5 V,50 W,R/TP ,small size		
6	C648	DIODE,TVS	EDTY0008501	TFSC ,5 V,50 W,R/TP ,small size		
6	C649	DIODE,TVS	EDTY0008501	TFSC ,5 V,50 W,R/TP ,small size		
6	CN201	CONN,JACK/PLUG, EARPHONE	ENJE0003602	12 ,12 PIN,MMIC CONN.12P		
6	CN303	CONNECTOR,I/O	ENRY0004501	24 PIN,0.5 mm,ETC , ,0.8 Offset type		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	CN304	CONNECTOR,ETC	ENZY0016901	3 PIN,2.5 mm,ETC , ,H=2.7		
6	CN401	CONNECTOR,BOARD TO BOARD	ENBY0015601	34 PIN,0.4 mm,STRAIGHT ,AU ,0.9MM HEIGHT		
6	CN402	CONNECTOR,BOARD TO BOARD	ENBY0012401	40 PIN,0.4 mm,ETC , ,		
6	CN403	CONNECTOR,BOARD TO BOARD	ENBY0029401	40 PIN,0.4 mm,ETC , ,H=3.0		
6	D101	DIODE,SWITCHING	EDSY0016001	ESM ,15 V,100 mA,R/TP ,PB-FREE		
6	D401	DIODE,SWITCHING	EDSY0012301	1-1E1A ,85 V,1 A,R/TP ,P=200mW, IFM=200mA		
6	D501	DIODE,SWITCHING	EDSY0012101	US-FLAT ,30 V,1 A,R/TP ,2.5*1.25*0.6(t)		
6	FB401	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FB402	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FB403	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FB404	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FB405	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FB406	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FL301	FILTER,EMI/POWER	SFEY0007101	SMD ,1CH,1608Feedthru ESD/EMI filter for power		
6	FL302	FILTER,CERAMIC	SFCY0000901	2450 MHz,2.00*1.25*0.95 ,SMD ,Bluetooth Band Pass Filter		
6	FL401	FILTER,EMI/POWER	SFEY0007103	SMD ,18 V , ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free		
6	FL402	FILTER,EMI/POWER	SFEY0007103	SMD ,18 V , ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free		
6	FL403	FILTER,EMI/POWER	SFEY0007103	SMD ,18 V , ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free		
6	FL404	FILTER,EMI/POWER	SFEY0007103	SMD ,18 V , ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free		
6	FL405	FILTER,EMI/POWER	SFEY0007103	SMD ,18 V , ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free		
6	FL406	FILTER,EMI/POWER	SFEY0007103	SMD ,18 V , ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free		
6	FL407	FILTER,EMI/POWER	SFEY0006801	SMD ,10Channel RC array filter, 80R,40pF shunt		
6	FL408	FILTER,EMI/POWER	SFEY0007103	SMD ,18 V , ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free		
6	FL409	FILTER,EMI/POWER	SFEY0007103	SMD ,18 V , ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free		
6	FL601	FILTER,SEPERATOR	SFAY0006503	900 ,1800.1900 ,3.7 dB,3.8 dB,30 dB,30 dB,ETC ,5.2*4.0*1.8 Size, Triple FEM with unbalanced SAW		
6	J501	CONN,SOCKET	ENSY0001608	6 PIN,ETC ,5D ,2.54 mm,1.8T		
6	L301	INDUCTOR,CHIP	ELCH0001413	22 nH,J ,1005 ,R/TP ,PBFREE		
6	M301	IC	EUSY0239102	6.9 * 7.9 * 1.5 mm ,28 PIN,R/TP ,Bluetooth Module v1.2, 26MHz, For GSM		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	MIC	MICROPHONE	SUMY0010601	UNIT ,42 dB,6.15*3.76*1.65 ,Bottom Silicon SMD		
6	Q401	TR,BJT,ARRAY	EQBA0002701	EMT6 , 150 mW,R/TP ,NPN, PNP, 150 mA		
6	R101	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R102	RES,CHIP	ERHY0000225	200 ohm,1/16W,J,1005,R/TP		
6	R103	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R104	RES,CHIP	ERHY0010201	1.2 Mohm,1/16W ,F ,1005 ,R/TP		
6	R105	RES,CHIP	ERHY0000106	100 ohm,1/16W,F,1005,R/TP		
6	R106	RES,CHIP	ERHY0000512	10M ohm,1/16W,J,1608,R/TP		
6	R107	RES,CHIP	ERHY0000267	24K ohm,1/16W,J,1005,R/TP		
6	R108	RES,CHIP	ERHY0000152	82K ohm,1/16W,F,1005,R/TP		
6	R109	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
6	R110	RES,CHIP	ERHY0000291	330K ohm,1/16W,J,1005,R/TP		
6	R111	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
6	R113	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R114	RES,CHIP	ERHY0000125	10K ohm,1/16W,F,1005,R/TP		
6	R115	RES,CHIP	ERHY0000125	10K ohm,1/16W,F,1005,R/TP		
6	R120	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R201	RES,CHIP	ERHY0000149	68K ohm,1/16W,F,1005,R/TP		
6	R202	RES,CHIP	ERHY0000149	68K ohm,1/16W,F,1005,R/TP		
6	R203	RES,CHIP	ERHY0000149	68K ohm,1/16W,F,1005,R/TP		
6	R204	RES,CHIP	ERHY0000149	68K ohm,1/16W,F,1005,R/TP		
6	R205	RES,CHIP	ERHY0000269	30K ohm,1/16W,J,1005,R/TP		
6	R207	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R208	RES,CHIP	ERHY0000269	30K ohm,1/16W,J,1005,R/TP		
6	R209	RES,CHIP	ERHY0000138	33K ohm,1/16W,F,1005,R/TP		
6	R210	RES,CHIP	ERHY0000138	33K ohm,1/16W,F,1005,R/TP		
6	R211	RES,CHIP	ERHY0000250	3.3K ohm,1/16W,J,1005,R/TP		
6	R213	RES,CHIP,MAKER	ERHZ0000478	3.3 ohm,1/16W ,J ,1005 ,R/TP		
6	R216	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R218	RES,CHIP,MAKER	ERHZ0000478	3.3 ohm,1/16W ,J ,1005 ,R/TP		
6	R222	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R223	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R224	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP		
6	R225	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R226	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R227	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP		
6	R229	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R230	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R231	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R232	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP		
6	R233	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R234	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
6	R235	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
6	R236	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R237	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R238	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R239	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R240	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R301	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R302	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R303	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R304	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R305	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R306	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R307	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R308	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R309	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R311	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R312	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R313	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R314	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R315	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R316	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R317	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R318	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R320	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R321	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R322	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R323	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R324	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R325	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R326	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R327	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R328	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R329	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R330	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R331	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R332	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R333	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R334	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R335	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R336	RES,CHIP	ERHY0000111	680 ohm,1/16W,F,1005,R/TP		
6	R337	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R339	RES,CHIP	ERHY0000269	30K ohm,1/16W,J,1005,R/TP		
6	R340	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP		
6	R341	RES,CHIP	ERHY0000269	30K ohm,1/16W,J,1005,R/TP		
6	R342	RES,CHIP	ERHY0000116	1.5K ohm,1/16W,F,1005,R/TP		
6	R343	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R344	RES,CHIP	ERHY0000230	330 ohm,1/16W,J,1005,R/TP		
6	R345	CAP,CERAMIC,CHIP	ECCH0000103	1.5 pF,50V,C,NP0,TC,1005,R/TP		
6	R348	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R349	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R350	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R351	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R352	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R353	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R354	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R401	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R402	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R403	RES,CHIP	ERHY0000208	22 ohm,1/16W,J,1005,R/TP		
6	R404	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R405	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R406	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R407	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R408	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R409	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R410	RES,CHIP	ERHY0000207	20 ohm,1/16W,J,1005,R/TP		
6	R411	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R412	RES,CHIP	ERHY0000226	220 ohm,1/16W,J,1005,R/TP		
6	R413	RES,CHIP	ERHY0000244	1.5K ohm,1/16W,J,1005,R/TP		
6	R414	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R502	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R503	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R504	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R506	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R510	RES,CHIP	ERHY0000150	75K ohm,1/16W,F,1005,R/TP		
6	R511	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R512	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R513	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R514	RES,CHIP	ERHY0000274	51K ohm,1/16W,J,1005,R/TP		
6	R515	RES,CHIP	ERHY0000274	51K ohm,1/16W,J,1005,R/TP		
6	R516	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R518	RES,CHIP	ERHY0000125	10K ohm,1/16W,F,1005,R/TP		
6	R519	RES,CHIP	ERHY0000141	39K ohm,1/16W,F,1005,R/TP		
6	R520	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R521	RES,CHIP	ERHY0000125	10K ohm,1/16W,F,1005,R/TP		
6	R522	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP		
6	R531	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R532	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R541	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R601	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R602	RES,CHIP	ERHY0000296	1M ohm,1/16W,J,1005,R/TP		
6	R603	INDUCTOR,CHIP	ELCH0001011	1.8 nH,J ,1005 ,R/TP ,Pb Free		
6	R606	RES,CHIP	ERHY0000262	12K ohm,1/16W,J,1005,R/TP		
6	R607	CAP,CERAMIC,CHIP	ECCH0000181	4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	R608	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		



## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R609	INDUCTOR,CHIP	ELCH0003820	3 nH,S ,1005 ,R/TP ,PBFREE		
6	R610	INDUCTOR,CHIP	ELCH0005002	2.7 nH,S ,1005 ,R/TP ,		
6	R611	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R612	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R633	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	SW601	CONN,RF SWITCH	ENWY0002201	ANGLE ,SMD ,0.8 dB,		
6	U101	IC	EUSY0181601	BGA ,148 PIN,R/TP ,GSM ANALOG BASEBAND, Pb Free		
6	U102	IC	EUSY0223002	HVSOF5 ,5 PIN,R/TP ,150mA CMOS LDO WITH OUTPUT CONTROL / 2.8V		
6	U103	IC	EUSY0251701	BGA ,204 PIN,R/TP ,Digital BaseBand Hermes+USB, Pb Free		
6	U201	IC	EUSY0259801	WLCSP ,67 PIN,R/TP ,WLCSP ,67PIN,R/TP ,MA5Si2(64POLY MIDI / Internal D-AMP)		
6	U202	IC	EUSY0119002	4X3 UCSP / CODE : B12-4 ,10 PIN,R/TP ,DUAL SPDT ANALOG SWITCHES(Pb Free)		
6	U203	IC	EUSY0227901	SON5-P-0.35(fSV) ,5 PIN,R/TP ,2-INPUT AND GATE, Pb Free		
6	U204	IC	EUSY0229501	88 BALL MATRIX SCSP (8*11*1.2) ,80 PIN,R/TP ,256M + 64M PSRAM / IO 3.0V / BOTTOM BOOT / PB FREE		
6	U301	DIODE,TVS	EDTY0006501	SC70-6L ,5.25 V,100 W,R/TP ,		
6	U302	IC	EUSY0163901	uCSP ,10 PIN,R/TP ,Dual Analog Switch, 300MHz Bandwidth		
6	U303	IC	EUSY0223002	HVSOF5 ,5 PIN,R/TP ,150mA CMOS LDO WITH OUTPUT CONTROL / 2.8V		
6	U304	IC	EUSY0227901	SON5-P-0.35(fSV) ,5 PIN,R/TP ,2-INPUT AND GATE, Pb Free		
6	U305	IC	EUSY0163901	uCSP ,10 PIN,R/TP ,Dual Analog Switch, 300MHz Bandwidth		
6	U401	IC	EUSY0239304	HVSOF6 ,6 PIN,R/TP ,300mA,2.9V,LDO		
6	U402	IC	EUSY0238301	DFN ,16 PIN,R/TP ,AAT3152(BL)+AAT3119(Flash)		
6	U403	IC	EUSY0239304	HVSOF6 ,6 PIN,R/TP ,300mA,2.9V,LDO		
6	U501	IC	EUSY0223003	HVSOF5 ,5 PIN,R/TP ,150mA CMOS LDO WITH OUTPUT CONTROL / 3.3V		
6	U502	IC	EUSY0277901	MLF ,10 PIN,R/TP ,Dual(1.8V/150mA,2.9V/300mA) LDO Regulator		
6	U503	IC	EUSY0273701	BGA ,63 PIN,R/TP ,512Mbit NAND Flash Memory		
6	U504	IC	EUSY0265202	BGA(8*8) ,140 PIN,R/TP ,3M Camera, TV Out, NAND I/F, Multi Media Chip		
6	U505	IC	EUSY0278101	MLF ,10 PIN,R/TP ,Dual(1.8V/150mA,3.0V/300mA) LDO Regulator		
6	U506	IC	EUSY0200301	Leadless chip ,6 PIN,R/TP ,Hall S/W, Pb Free		
6	U507	IC	EUSY0200301	Leadless chip ,6 PIN,R/TP ,Hall S/W, Pb Free		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	U508	IC	EUSY0254701	DFN 3*3*0.9 ,10 PIN,R/TP ,Charger IC, I Max 1A, Wall Adaptor/USB Charger		
6	U601	IC	EUSY0077201	SC70 ,5 PIN,R/TP ,Inverter Gate, Pb Free		
6	U602	IC	EUSY0263001	MCM ,64 PIN,R/TP ,RFIC integrated PAM, 6 *11Size		
6	VA204	VARISTOR	SEVY0001001	14 V ,SMD ,50pF, 1005		
6	VA207	VARISTOR	SEVY0003801	18 V ,SMD ,		
6	VA208	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	VA209	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	VA210	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	VA211	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	VA212	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	VA213	VARISTOR	SEVY0003801	18 V ,SMD ,		
6	VA214	VARISTOR	SEVY0003801	18 V ,SMD ,		
6	VA215	VARISTOR	SEVY0003801	18 V ,SMD ,		
6	VA216	VARISTOR	SEVY0003801	18 V ,SMD ,		
6	VA301	VARISTOR	SEVY0003801	18 V ,SMD ,		
6	VA302	DIODE,TVS	EDTY0008501	TFSC ,5 V,50 W,R/TP ,small size		
6	VA303	VARISTOR	SEVY0003801	18 V ,SMD ,		
6	VA304	VARISTOR	SEVY0003801	18 V ,SMD ,		
6	VA305	VARISTOR	SEVY0003801	18 V ,SMD ,		
6	X101	X-TAL	EXXY0004601	.032768 MHz,20 PPM,7 pF,65000 ohm,SMD ,6.9*1.4*1.3 ,		
6	X601	VCTCXO	EXSK0006201	13 MHz,2 PPM,10 pF,SMD ,3.2*2.5*1.0 ,		
5	SAFD00	PCB ASSY,MAIN,SMT TOP	SAFD0060301			
6	ANT301	ANTENNA,GSM,FIXED	SNGF0009601	3:1 ,0 dBd , ,3:1,BT Chip Antenna Pb-Free SMD		
6	L200	INDUCTOR,CHIP	ELCH0004715	27 nH,J ,1005 ,R/TP ,		
6	L202	INDUCTOR,CHIP	ELCH0004715	27 nH,J ,1005 ,R/TP ,		
6	L204	INDUCTOR,CHIP	ELCH0004715	27 nH,J ,1005 ,R/TP ,		
6	L206	INDUCTOR,CHIP	ELCH0004715	27 nH,J ,1005 ,R/TP ,		
6	VA306	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	VA307	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	VA308	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	VA309	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
5	SPFY00	PCB,MAIN	SPFY0110601	FR-4 ,1.0 mm,STAGGERED-8 ,P7200		32
3	SAJY00	PCB ASSY,SUB	SAJY0013701			

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
4	SAJE00	PCB ASSY,SUB,SMT	SAJE0008101			
5	SAJC00	PCB ASSY,SUB,SMT BOTTOM	SAJC0007001			
6	C700	CAP,TANTAL,CHIP	ECTH0002201	10 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C701	CAP,TANTAL,CHIP	ECTH0002201	10 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C702	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C703	CAP,CERAMIC,CHIP	ECCH0007701	1 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C704	CAP,CERAMIC,CHIP	ECCH0000126	68 pF,50V,J,NP0,TC,1005,R/TP		
6	C705	CAP,CERAMIC,CHIP	ECCH0000153	6.8 nF,25V,K,X7R,HD,1005,R/TP		
6	C706	CAP,TANTAL,CHIP	ECTH0002201	10 uF,6.3V ,M ,STD ,1608 ,R/TP		
6	C707	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C708	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C709	DIODE,TVS	EDTY0008501	TFSC ,5 V,50 W,R/TP ,small size		
6	C710	DIODE,TVS	EDTY0008501	TFSC ,5 V,50 W,R/TP ,small size		
6	C712	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C713	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C714	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C731	VARISTOR	SEVY0003901	5.5 V , ,SMD ,480pF, 1005		
6	LD700	DIODE,LED,MODULE	EDLM0008601	WHITE ,1 LED,2.0*1.5*0.45 ,R/TP ,PB-FREE		
6	MIC700	MICROPHONE	SUMY0010503	UNIT ,35 dB,4*1.35 ,Bridge SMD MIC		
6	R700	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R701	RES,CHIP	ERHY0000276	68K ohm,1/16W,J,1005,R/TP		
6	R702	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R703	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP		
6	R704	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP		
6	R705	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R706	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP		
6	S700	CONN,SOCKET	ENSY0014101	8 PIN,ETC , ,1.1 mm,T-Flash Memory Socket		
6	U102	IC	EUSY0223002	HVSOF5 ,5 PIN,R/TP ,150mA CMOS LDO WITH OUTPUT CONTROL / 2.8V		
6	U700	IC	EUSY0250101	MSOP ,8 PIN,R/TP ,AC_182Vpp EL DRIV		
6	U710	IC	EUSY0223007	HVSOF5 ,5 PIN,R/TP ,2.5V, 150mA,LDO		
6	VA700	VARISTOR	SEVY0003901	5.5 V , ,SMD ,480pF, 1005		
6	VA701	VARISTOR	SEVY0003901	5.5 V , ,SMD ,480pF, 1005		
5	SAJD00	PCB ASSY,SUB,SMT TOP	SAJD0008101			

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C711	CAP,CERAMIC,CHIP	ECCH0007701	1 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C750	CAP,CERAMIC,CHIP	ECCH0000251	2.2 nF,50V,K,X7R,HD,1608,R/TP		
6	CN700	CONNECTOR,BOARD TO BOARD	ENBY0029501	40 PIN,0.4 mm,ETC , ,H=3.0, Socket		
6	L700	INDUCTOR,SMD,POWER	ELCP0006801	820 uH,K ,3.8*3.8*1.3 ,R/TP ,		
6	R707	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R709	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R710	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R711	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R713	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R714	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R715	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R750	RES,CHIP	ERHY0008605	33 ohm,1/4W ,J ,2012 ,R/TP		
6	ZD700	DIODE,ZENER	EDNY0010401	USC ,100 V,0.2 W,R/TP ,		
5	SPJY00	PCB,SUB	SPJY0020401	FR-4 ,1.0 mm,BUILD-UP 6 ,P7200 SUB PCB		33

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

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### 12.3 Accessory

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
3	MHBY00	HANDSTRAP	MHBY0002902		Without Color	
3	SBPP00	BATTERY PACK,LI-POLYMER	SBPP0013302	3.7 V,800 mAh,1 CELL,PRISMATIC ,P7200 AREBK BATT. Pb-Free	Black	17
3	SGDY00	DATA CABLE	SGDY0005601	DK-40G ,K8000 24PIN I/O + USB A TYPE		
3	SGEY00	EAR PHONE/EAR MIKE SET	SGEY0005506	P7200 ,(12PMMI)REMOCON(BK)		
3	SSAD00	ADAPTOR,AC-DC	SSAD0007837	FREE ,50 Hz,5.2 V,800 mA,CE,CB ,		